

FM 1-10
copy 2

S/S FM 55-41, 31 Oct 73

FM 1-10

DEPARTMENT OF THE ARMY FIELD MANUAL

Ch 1, 2,

**ARMY AVIATION ORGANIZATIONAL
AIRCRAFT MAINTENANCE**

**RETURN TO ARMY LIBRARY
2004 1 A 512 PENTAGON**



**HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1965**



1

2



3

4

5

6



CHANGE }
No. 2 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 4 April 1969

ARMY AVIATION ORGANIZATIONAL AIRCRAFT MAINTENANCE

FM 1-10, 20 September 1965, is changed as follows:

1. New or changed material is indicated by a star.
2. Remove old pages and insert new pages as indicated below.

Remove old pages	Insert new pages
i	i
1-1	1-1
2-1 and 2-2	2-1 and 2-2
3-3 through 3-5	3-3 through 3-5
4-3 through 4-7	4-3 through 4-6
5-1 through 5-10	5-1 through 5-10
6-1 through 6-4	6-1 through 6-4
7-1 through 7-4	7-1 through 7-4
7-7 through 7-10	7-7 through 7-11
8-1 through 8-8	8-1 through 8-8
9-1 and 9-2	9-1 and 9-2
10-1 through 10-4	10-1 through 10-4
11-1 through 11-4	11-1 through 11-4
AI-1 and AI-2	AI-1 and AI-3
AIII-1 through AIII-3	AIII-1 through AIII-3

3. File this change sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-11 requirements
for Army Aviation Organizational Aircraft Maintenance and Supply.

RETURN TO ARMY LIBRARY
ROOM 1 A 518 PENTAGON



CHANGE }
No. 1 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 21 April 1967

ARMY AVIATION ORGANIZATIONAL AIRCRAFT MAINTENANCE

FM 1-10, 20 September 1965, is changed as follows:

1. New or changed material is indicated by a star.
2. Remove old pages and insert new pages as indicated below.

Remove pages—	Insert pages—
3-3 through 3-5.....	3-3 through 3-5.
4-3 and 4-4.....	4-3 and 4-4.
5-1 and 5-2.....	5-1 and 5-2.
7-1 through 7-4.....	7-1 through 7-4.
AIII-1 and AIII-2.....	AIII-1 and AIII-2.

3. The following changes will be made in pen and ink:

Page	Paragraph	Line	Action
✓ 3-2.....	3-3c.....	2	Change "(Unit Readiness)" to "(Unit Readiness Report)".
✓ 4-2.....	4-1d.....	7	Change "or responsible" to "of responsible".
✓ 4-5.....	4-6b.....	3	Delete ", and CV-2"; add "and" after "U-8".
✓ 4-6.....	4-8.....	3	Change "or" to "of".
✓ 4-6.....	4-8.....	5	Delete "skill held in the secondary MOS AR 600-200)".
✓ 4-6.....	4-8.....	7	Change "CH-13" to "OH-13".
✓ 5-5.....	5-5b.....	5	Change "simultaneously" to "simultaneously".
✓ 5-5.....	5-6a(3).....	4	Change "corected" to "corrected".
✓ 5-5.....	5-7.....	Title	Change "Inspection" to "Inspections".
✓ 5-8.....	5-11b(1).....	1	Change "enable" to "enables".
✓ 5-8.....	5-11b(2).....	1	Change "enable" to "enables".
✓ 5-9.....	5-12a.....	4	Delete "of complete ignorance".
✓ 5-10.....	5-14.....	3	Add "for" after "provide".
✓ 6-1.....	6-2a(2).....	6	Add "AR" after "in".
✓ 8-5.....	8-10c(1).....	2	Change "formation" to "information".
✓ 8-5.....	8-11a(2).....	1	Change "quatities" to "quantities".
✓ 8-7.....	8-16b(3)(e).....	1	Change "hatchet" to "ratchet".
✓ 9-4.....	9-3h(10).....	6	Change "do" to "due".
✓ AI-1.....	Appendix I.....	1	Change "Material" to "Materiel".
✓ AIII-3.....	12.....	3	Add "and" after "hand".

4. This transmittal sheet should be filed in front of the manual for reference purposes.

RETURN TO ARMY LIBRARY
ROOM 1 A 518 PENTAGON

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-11 requirements for
Army Aviation—Organizational Aircraft Maintenance and Supply.

FIELD MANUAL

No. 1-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 20 September 1965

ARMY AVIATION ORGANIZATIONAL AIRCRAFT MAINTENANCE

	Paragraph	Page
CHAPTER 1. PURPOSE AND SCOPE	1-1, 1-3	1-1
2. THE MAINTENANCE SYSTEM	2-1-2-5	2-1
CHAPTER 3. MAINTENANCE MANAGEMENT AND EQUIPMENT RECORD PROCEDURES		
Section I. Maintenance management	3-1-3-3	3-1
II. Equipment record procedures	3-4, 3-5	3-3
CHAPTER 4. CONTROL AND SUPERVISION OF MAINTENANCE		
Section I. Fundamentals and functions of management ..	4-1-4-3	4-1
II. MOS structure	4-4-4-11	4-3
CHAPTER 5. ORGANIZATIONAL MAINTENANCE OPERATIONS		
Section I. Organizing to perform maintenance	5-1-5-4	5-1
II. Maintenance scheduling	5-5-5-13	5-4
III. Maintenance under combat and other conditions	5-14-5-20	5-10
CHAPTER 6. AIRCRAFT MAINTENANCE TRAINING ..	6-1, 6-2	6-1
CHAPTER 7. PUBLICATIONS AND CHARTS		
Section I. Publications	7-1-7-4	7-1
II. Charts	7-5-7-10	7-5
CHAPTER 8. AVIATION TECHNICAL SUPPLY		
Section I. General	8-1-8-7	8-1
II. Repair parts procedures	8-8-8-13	8-3
III. Storage and issue turn-in procedures	8-14-8-18	8-6
CHAPTER 9. MAINTENANCE OF ARMY AIRCRAFT UNDER EXTREME WEATHER CONDITIONS	9-1-9-7	9-1
10. GROUND SAFETY IN MAINTENANCE WORK	10-1-10-4	10-1
CHAPTER 11. QUALITY CONTROL		
Section I. Maintenance standards	11-1-11-6	11-1
II. Technical inspections	11-7-11-10	11-3
APPENDIX I. REFERENCES		AI-1
II. SAMPLE GUIDE: MAINTENANCE AND TECHNICAL SUPPLY STANDING OPERATING PROCEDURES		AII-1
III. INSPECTION GUIDES FOR ORGANIZA- TIONAL MAINTENANCE AND TECHNICAL SUPPLY		AIII-1
INDEX		I-1

*This manual supersedes FM 1-10, 17 August 1960, including C1, 16 April 1962, and TM 1-320, 25 July 1963.



CHAPTER 1

PURPOSE AND SCOPE

1-1. Purpose and Scope

This manual provides basic information on principles, concepts, and techniques of organizational aircraft maintenance and technical supply. It furnishes guidelines for commanders, staff officers, and organizational maintenance and supply supervisors in management, supervision, and in scheduling of aircraft maintenance.

1-2. Report of Training Literature Improvements

Reports of errors, omissions, and recommenda-

tions for improving this manual by the individual user are encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commandant, U.S. Army Transportation School, ATTN: Office of Doctrine Development, Literature and Plans, Fort Eustis, Virginia 23604.

1-3. Application of Material

The material contained herein is applicable to both nuclear and nonnuclear warfare.



1
2
3
4



5
6
7
8



CHAPTER 2

THE MAINTENANCE SYSTEM

2-1. General

a. The objectives and concepts of maintenance, definition of the Army maintenance system, policies governing the conduct of maintenance operations, and the responsibilities for the maintenance of equipment adopted for Army use are covered in detail in AR's 750-1 and 750-5.

b. Maintenance of equipment includes all the work required to—

- (1) Prevent its breakdown or deterioration.
- (2) Restore it to serviceable condition.
- (3) Determine its disposition when uneconomically repairable.
- (4) Determine requirements for its evacuation when unserviceable.
- (5) Provide repair parts support.

2-2. Materiel Readiness (AR 11-14)

a. *Definition.* Materiel readiness is the condition of materiel in every Army organization (measured for quality, quantity, and serviceability) which permits the prompt and economical fulfillment of assigned tasks. It includes—

(1) Determining the status of equipment in relation to standards established for specific end items and organizational materiel.

(2) Correcting and reporting factors which contribute to deficiencies of equipment such as manpower shortages; lack of funds; improper training; failure to conserve equipment life; shortages of repair parts, tools, and facilities; and poor maintenance management.

b. *Objective.* The Army's highest priority peacetime function is to attain and maintain a combat operational status sufficient for units to accomplish their assigned missions in accordance with the time schedule established in operation and contingency plans. Combat readi-

ness requires both ready personnel and ready materiel. Materiel or equipment maintenance is one of the most critical and complex problems of the Army. A prime Army mission is to have forces with an early deployment capability ranging from a few hours to a few days. That capability demands a constant state of materiel readiness in balance with personnel readiness consistent with the mission of each unit.

c. *Responsibilities.* Commanders, soldiers, and civilians at all levels should realize the importance of maintaining materiel in a ready condition. This is an Army-wide, worldwide problem involving all officers, warrant officers, enlisted personnel, and civilians. A proper priority application of available resources is required so that funds, manpower, management, and technical skills are applied to improve materiel readiness. Organizational maintenance units have the responsibility for achieving the desired standards of aircraft availability. Commanders at all levels should take the following action:

- (1) Designate a materiel readiness officer.
- (2) Instruct each individual on his mandatory obligation to maintain his equipment in the assigned state of readiness.

(3) Provide adequate time for the performance of preventive maintenance. *Materiel readiness must be considered equal to that of personnel training and readiness.*

(4) Insure prompt repair of equipment deficiencies.

(5) Consider placing certain items in storage when resources necessary to maintain the required state of readiness are not available.

(6) Conduct sufficient command inspections to determine the actual condition of each unit's equipment.

(7) Reflect the actual condition of equipment in Materiel Readiness and Operational Readiness reports.

2-3. Objectives of Maintenance

The objectives of maintenance are to—

- a. Assist in assuring the capability of Army units to accomplish assigned missions.
- b. Predict, prevent, detect, isolate, and correct incipient failures by preventive maintenance services and inspections.
- c. Keep all types of equipment ready for their intended use.
- d. Minimize requirements for replacement equipment.
- e. Insure the maximum economical service life of all Army equipment.
- f. Be immediately responsive to, and be prepared to support, increased requirements of supported units occasioned by increases in operational activity.
- g. Return required unserviceable, economically repairable equipment to a serviceable condition with minimum expenditure of men, money, and material.

2-4. Principles of Maintenance

- a. Each commander is responsible for his assigned maintenance.
- b. Maintenance will be performed in accordance with published maintenance doctrine at the lowest category consistent with the tactical situation, skills, time, repair parts, tools, and test equipment available.
- c. Repairs will be accomplished on site, whenever feasible, and in accordance with maintenance allocation charts.
- ★d. Unserviceable material, the repair of which is beyond the maintenance capability of an organization, will be tagged and reported, delivered, or evacuated to the next higher maintenance organization. Tagging of materiel with materiel condition tags will be in accordance with TB 750-126.
- e. Whenever possible, all authorized maintenance within the capability of an organization will be accomplished before evacuation of economical repairable items to the next higher

maintenance organization. Higher categories will perform the maintenance functions of lower categories when required or directed by appropriate commander.

★f. As a source of repair parts and assemblies, controlled cannibalization, as prescribed in AR 750-50 may be used to support maintenance of equipment.

g. Repairs will be accomplished under the “inspect and repair only as needed” (IROAN) principle at organizational and direct support levels of command. General support and depot maintenance will be accomplished to permit return of an item to the supply system in accordance with maintenance standards established for each item of equipment (AR 750-5).

2-5. Categories of Maintenance

Maintenance responsibilities are assigned to specific levels of command in accordance with the primary mission characteristics, mobility of the level involved, and the economical distribution of resources.

a. The maintenance system is divided into four mutually supporting categories in order to—

- (1) Relate maintenance to other military operations.
- (2) Provide organizations for maintenance operations in the field.
- (3) Facilitate the assignment of maintenance missions and responsibilities to specific levels of command.
- (4) Permit the orderly and efficient distribution of available maintenance resources.

b. The four categories of maintenance are—

(1) *Organizational*. Organizational maintenance is that maintenance normally authorized for, performed by, and the responsibility of a using organization on equipment in its possession. This maintenance consists of functions and repairs within the capabilities of authorized personnel, skills, tools, and test equipment as prescribed in appropriate Department of the Army TOE's or TD's. Maintenance exceeding the authorized scope may be performed when authorized by the next higher maintenance support commanders.

- (2) *Direct support.* Direct support maintenance is that maintenance normally authorized and performed by designated maintenance activities in direct support of using organizations. This maintenance is limited to the repair of end items or unserviceable assemblies in support of using organizations on a return-to-user basis.
- (3) *General support.* General support maintenance is that maintenance authorized and performed by designated TOE and TD organizations in support of the Army supply system. Normally

TOE and TD general support maintenance organizations will repair or overhaul materiel to required maintenance standards in a ready-to-issue condition based upon applicable supported Army area supply requirements.

- (4) *Depot.* Depot maintenance is that maintenance which provides repair of materiel beyond the capability of general support maintenance organizations. It augments the procurement program by helping to satisfy overall Army requirements through overhaul of economically repairable materiel.



1

2



3

4

5



CHAPTER 3

MAINTENANCE MANAGEMENT AND EQUIPMENT RECORD PROCEDURES

Section I. MAINTENANCE MANAGEMENT

3-1. General

a. Maintenance management is designed to assist commanders at all levels in attaining maximum states of materiel readiness. The maintenance system is based on maintenance data flowing from using units through channels to national agency level with processed data feedback to the units. The analyzed data must be distributed to all command and staff elements having a need for such information, including the organizations which generated the raw data. The type of data collected, the frequency of collection, and the uses of data by commanders are covered in TM's 38-750, 38-750-1, and 38-750-2.

b. The demands of modern warfare require the management of maintenance on a massive scale. Maintenance management is a control task that has grown in direct relation to the expansion in complexity and scope of functions that are to be controlled. The technical development of equipment for the Army has produced a broadened base of inventory, larger variety of materiel, and has increased complexity in all areas. Added to the complexity of materiel is the unique operational mission of the Army. Maintenance of this highly technical inventory must be performed by the operational elements themselves, using their own personnel and facilities under environmental and operational conditions dictated by the mission. The maintenance planner is faced with a highly dispersed Army, complicated by vast distance and channels of communication through which a feedback of vital use experience and performance data must return, be digested, and acted upon. Features of maintenance management include (1) one technical procedures manual for all equipment (TM 38-750), (2) one maintenance language, (3) standardization of maintenance procedures, (4)

improved means of determining materiel readiness, (5) recording and transmitting of vital maintenance data at all levels of command, and (6) compatibility of the system with Army reorganization plans.

c. The objectives of collecting, processing, and using maintenance data are to provide commanders with information necessary for determining equipment status and materiel readiness, effectiveness of maintenance operations, adequacy of resources, and support requirements.

3-2. Levels of Activity

Implementation of the Army's maintenance management system involves a program of interrelated actions, each basically simple in its concept and application yet capable of contributing to and benefiting from a master system. This system has three clearly identifiable and easily recognized levels of activity. They are the operational units, field commands, and national agencies.

a. *Operational Units* (TM 38-750). The operational units are the source of almost all the data that is fed into the system. Management activity begins when the unit commander uses this data as a tool to check his operational status, his trouble spots, equipment use, and performance. The organizational commanders are responsible for the accuracy and completeness of information and timely submission of all data collection documents. They should assure that personnel are adequately trained in preparation of forms and records as a means of assisting them in carrying out this responsibility.

b. *Field Commands* (TM 38-750-1). Maintenance management is implemented by field commands at the division or installation level.

Information is received there from two directions—from the using units and as feedback from national agencies. The information at this level of maintenance management is collected and processed, for the most part by machine, giving the field commander a system for rapid analysis those materiel factors which affect the accomplishment of his mission. Compilation and analysis at this level generates feedback into the other two levels—national agency and using units.

c. *National Agencies* (TM 38-750-2). The third segment of the system involves collection of input data from the using unit level and field command level. This data is compiled, analyzed, and stored at the national agency level. It is used by the command to evaluate readiness status, performance, and needs for resources. It is also used for planning procurement of parts and major items and to develop both modification and new materiel. Feedback then flows to the other two levels.

3-3. Maintenance Management Information System

This system consists of documentation and reporting of aircraft status and/or aircraft maintenance repair and servicing.

a. *Equipment Serviceability Criteria (ESC)*. AR 750-10 provides commanders at all levels with a uniform method of evaluating serviceability of equipment. The objective of the regulation is to prescribe and define categories of equipment serviceability for selected items of equipment and to provide a uniform method of describing unit equipment serviceability. Evaluation of equipment serviceability is based upon the capability of the materiel to perform the intended combat function and to sustain this performance for a stated period. Only conditions which restrict or prevent the intended combat function are considered in ESC. The ESC for selected items of equipment are published as separate TM's (technical manuals); i.e., TM 55-1510-202-ESC. ESC are designed to be kept in equipment log book binders (para 3-5f). Selected items will be assigned to a "category of equipment serviceability" based on serviceability condition and potential. This categorizing will provide the unit with a method for determining an accurate equipment service-

ability profile. The three categories of equipment serviceability are—

- (1) *Green*. Combat-ready equipment free of any condition which limits the reliable performance of its primary mission for a period of 90 days.
- (2) *Amber*. Combat equipment possessing limiting conditions which may restrict a reliable performance of its primary mission.
- (3) *Red*. Combat equipment unable to perform its primary mission immediately or having an unacceptable reliability for sustained performance (90 days) of its primary mission.

b. *Army Aircraft Inventory, Status, and Flying Time* (DA Form 1352).

- (1) The status of aircraft will be reported monthly by the organization having accountability on the last day of the month. This report will be submitted on DA Form 1352 in the number of copies specified by the Army area or oversea command. It must reach the appropriate command headquarters on the second working day of the month following the reported month. See AR 710-12 for complete instructions on the preparation and submission of this report.
- (2) Organizations losing Army aircraft through transfer are responsible for transferring statistical data to the gaining organization for that portion of the month the aircraft was on its accountable records. DA Form 1352 will be completed for each aircraft and transferred with the aircraft records. An information copy will be forwarded to the appropriate headquarters. Aircraft on loan will be reported by the organization having accountability; "unknown" will not be used. If accurate data cannot be obtained, an estimate will be made based on past experience.

c. *Unit Readiness* (AR 220-1). Each unit will submit a DA Form 2715 (Unit Readiness) ^{Report} each quarter. This report will indicate the operational readiness of the unit based on uni-

form standards for all units in the active Army. It requires an overall evaluation of personnel, training, and logistics for each combat unit and combat support unit. The unit equipment profile (UEP) is combined with supply, training, and personnel status. This combination results in a definite expression of the unit's combat readiness that can be compared with the operational mission of the unit. The readiness report is based on the following categories of information:

(1) *Readiness requirement (REDCAT)*. The level of readiness assigned in peacetime to each unit of a command as required by that command to accomplish its assigned missions in relation to the deployment schedule of the unit.

(2) *Readiness capability (REDCAPE)*. The level of readiness assigned each unit which is within the capability of the major Army command to support with programed and/or allocated resources.

(3) *Readiness condition (REDCON)*. The actual level of readiness of a unit.

d. Equipment Maintenance Record. (DA Form 2408-3). DA Form 2408-3 provides a record of maintenance services, inspections, and repairs requiring parts usage at the organizational level. It also provides a method of recording and reporting status of equipment availability and serviceability and is a source document for the collection of maintenance en-

gineering data. This form will be closed out at the end of each calendar quarter. The national maintenance point copy (copy 3) for all items listed in appendix III, TM 38-750, will be forwarded to the appropriate addressee. Prior to submitting this form the unit must perform an equipment serviceability criteria evaluation. The findings of this evaluation will be entered in block 14 and explained in block 12 if the serviceability of the item is red.

e. Materiel Readiness Report (DA Form 2406). DA Form 2406 provides information on the readiness status of equipment in the hands of using organizations. This report will be prepared on a quarterly basis for selected items of equipment and copies will be sent in accordance with TM 38-750. Information in the report is designed to—

(1) Provide commanders at lower levels with equipment status information for planning day to day operations.

(2) Provide installation and organization commanders with information on maintenance backlogs, serviceability of equipment, density of equipment, and availability of equipment for operations.

(3) Provide commanders with the materiel readiness status of equipment in using units.

(4) Provide the desired condition of materiel readiness for designated items of equipment to the Department of the Army.

Section II. EQUIPMENT RECORD PROCEDURES

3-4. General

TM 38-750 contains the Army equipment record procedures to be used for the control, operation, and maintenance of all Army equipment. It prescribes procedures for the use, preparation, and disposition of forms and records of the Department of the Army's integrated equipment record and maintenance management system. Proper use, preparation and submission of the forms covered in TM 38-750 by operational units is the key to the entire integrated system. These forms are used by the commander to check his operational status, trouble spots, and equipment use and perform-

ance. TM 38-750 prescribes the records which are required for each item of equipment and lists those forms and records which provide input to logistic management. The following is the scope of TM 38-750.

a. Application of the integrated system to Army equipment in support of effective materiel readiness.

b. Mandatory equipment improvement reporting.

c. Recording and mandatory reporting of MWO (modification work order) requirements and accomplishments.

d. Correlation between equipment technical manuals and the integrated system.

e. Recording essential information to be used for evaluation of materiel readiness as prescribed by maintenance management procedures (TM 38-750-1).

f. Engineering data for design of new equipment, redesign of standard equipment, and product improvement.

3-5. Forms and Records

The following forms and records are used by organizational aircraft maintenance units. Instructions for their use, preparation, and disposition are contained in TM 38-750.

a. *DA Form 2402, Exchange Tag*. This form will be used to identify unserviceable parts being exchanged, repaired, or held as an EIR exhibit.

b. *DA Form 2404, Equipment Inspection and Maintenance Worksheet*. The DA Form 2404 provides a standard procedure for recording—

(1) Equipment faults found as a result of inspection, by maintenance activities, diagnostic checkouts, and spot check inspection of equipment.

(2) The results of command maintenance management inspection (CMMI), when desired as a worksheet only.

(3) The results of equipment serviceability criteria tests and checks prescribed by AR 750-10.

c. *DA Form 2405, Maintenance Request Register*. This is an internal shop management record which provides a Record of Maintenance Requests (DA Form 2407) and Component Removal and Repair/Overhaul Records (DA Form 2410) processed within a maintenance activity.

d. *DA Form 2406, Materiel Readiness Report*. For an explanation of this form, see paragraph 3-3e.

e. *DA Form 2407, Maintenance Request and DA Form 2407-1, Continuation Sheet*. These forms are used at organizational level to—

- (1) Request maintenance services.
- (2) Report accomplishment of modification work orders.
- (3) Submit equipment improvement report (EIR).

(4) Report receipt of defective materiel, except items damaged in shipment.

f. *Equipment Logbook Binder (FSN 7510-889-3494)*. The equipment logbook binder will contain those forms prescribed for each item of equipment and will remain with the equipment to which it pertains.

g. *DA Form 2408, Equipment Log Assembly (Records)*. This form is a permanent part of the logbook and is used to provide a ready reference to assembly instructions and symbols to be used in equipment logs.

h. *DA Form 2408-3, Equipment Maintenance Record (Organizational)*. For an explanation of this form, see paragraph 3-3d.

i. *DA Form 2408-5, Equipment Modifications Record*. This form is used to record the requirements for an application of all authorized modification.

j. *DA Form 2408-7, Equipment Transfer Report*. The transfer report provides a record of transfer of items on which a historical record is mandatory, and for which maintenance data is to be collected as indicated in TM 38-750.

k. *DA Form 2408-8, Equipment Acceptance and Registration Record*. This form is strictly informational at user level. It is used to record the status of the equipment when it is received from the manufacturer, and provides a record of overhaul and rebuild on equipment while in the Army inventory that results in a change of the federal stock number.

l. *DA Form 2408-12, Army Aviator's Flight Record*. This form is used to record actual aircraft time and duty and type of flight performed by the aviator and crew.

m. *DA Form 2408-13, Aircraft Inspection and Maintenance Record*. This form is used to—

- (1) Record detected faults and the action taken to correct them.
- (2) Maintain a continuing record of aircraft flying hours.
- (3) Record maintenance and servicing performed.
- (4) Indicate when scheduled maintenance inspections come due.
- (5) Indicate status of the aircraft and of installed mission essential equipment.

n. *DA Form 2408-14, Uncorrected Fault Record*. This form is used to record uncorrected faults to include overdue replacement of components, and the reason therefor.

o. *DA Form 2408-15, Historical Record for Aircraft*. The historical record is used to record significant historical data for an aircraft while it is in the Army inventory.

★p. *DA Form 2408-16, Aircraft Component Historical Record*. This form is used as a permanent record of time change components and selected condition items that are installed or have been removed from an aircraft or a major component (TB 55-1500-307-25).

q. *DA Form 2408-17, Aircraft Inventory Record*. This form provides an accurate and exact checklist of property assigned to the aircraft which is subject to periodic inventory.

★r. *DA Form 2408-18, Equipment Inspection List*. This form is used to maintain a list of inspections accomplished at intervals which are not related to airframe operating time or

aircraft inspection intervals. This form is also used to record directed interim reoccurring inspections until these inspections are incorporated in the applicable -20 technical manual.

★s. *DA Form 2408-19, Aircraft Engine Turbine Wheel Historical Record*. This is a non-feedback form designed to remain with applicable turbine wheels throughout their service life. It will provide significant historical data for use in determining requirements for overhaul and for replacement.

★t. *DA Form 2409, Equipment Maintenance Log (Consolidated)*. This form is used as a separate equipment log and provides a complete maintenance history of an item of equipment.

★u. *DA Form 2410, Component Removal and Repair/Overhaul Record*. This form provides a record and report for the control of all aircraft engines and specific aircraft components. It will be prepared for all time change components and selected condition items. See TB 55-1500-307-25 for condition items.



11
12
13
14



15
16
17
18



CHAPTER 4

CONTROL AND SUPERVISION OF MAINTENANCE

Section I. FUNDAMENTALS AND FUNCTIONS OF MANAGEMENT

4-1. Principles of Organization

An organization is an association of persons formed to attain a common purpose. It provides for a practical network of communication and control, the orderly and effective participation of members, and the execution of the plan of the leader. The four basic principles of organization are unity of command, span of control, homogeneous assignment, and the delegation of authority.

a. Unity of Command. The military organization, built upon unity of command, requires each individual within an organization to be responsible to his immediate superior. He must learn the chain of command and abide by it. Lines of authority should be short, definite, and understood by all. Each supervisor is responsible for a specific number of subordinates. He gives orders, monitors subordinate's efforts, and is the one to whom subordinates report. Bypassing the line of authority results in a divided command and inefficiencies.

b. Span of Control. Span of control is that principle which limits the number of direct subordinates and the area of supervision, and economizes on the use of time. It deals with three factors—numbers, distance, and time.

- (1) *Numbers.* One person should not supervise less than three or more than seven subordinates. If he supervises less than three, he is doing some of the work himself, and is therefore a part-time member of the group he is authorized to direct, with clear identity in neither group. If he supervises more than seven, supervisor-subordinate relationships are increased to such an extent that efficient management is impaired.

- (2) *Distance.* Subordinates and/or activities should be centrally located to permit ease of supervision. When the distance between activity and supervisor is too great, under-supervision results.

- (3) *Time.* This factor deals with the way the supervisor uses his time. A supervisor's job consists of three main types of work—*regular*, *special*, and *creative*. He schedules his time so that each type of work receives the proper amount of attention. *Regular* work is that which can be done only by the supervisor, such as supervising activities, initiating reports, and conducting meetings. *Special* work is an assignment given to a supervisor by his superior and is not related to his regular work. *Creative* work is that which strives to improve the regular work of the supervisor and his subordinates, such as devising new training programs or better methods of doing a job.

c. Homogeneous Assignment. Homogeneous assignment is the process of grouping like or related duties together at all organizational levels, and assigning personnel to these groupings according to their aptitudes and capabilities. By applying a sound analysis of the job and the individual, the highest degree of job efficiency will be attained. This will insure that—

- (1) Activities do not overlap.
- (2) Responsibilities are clear-cut and similar in nature.
- (3) Each responsibility is assigned to some qualified individual.
- (4) Improper classification and mal-

signment, with the accompanying morale breakdown, are avoided.

d. Delegation of Authority. Authority means the legal right to act; therefore, the assignment of responsibilities to subordinates must be accompanied by a delegation of authority. The supervisor, however, is still responsible for the assignment and he must fully support the actions and/or decisions of responsible subordinates. By wisely dividing responsibilities and delegating authority to his subordinates, the supervisor will have freedom of action and an organization which should function effectively in his absence.

4-2. Functions of Management

Functions of management include the actions taken by a supervisor to perform his assigned tasks. These functions include planning, organizing, directing, controlling, and coordinating.

a. Planning. When planning, the supervisor selects a course of action for the future. The planning function can be divided into four steps:

- (1) *Understanding the mission.* Knowing what is to be done, why it is to be done, and the objective to be attained.
- (2) *Evaluating the situation.* Carefully considering factors including availability of time, space, personnel, and materiel.
- (3) *Classifying possible courses of action.* Classifying possible course of action as suitable, feasible, and acceptable.
- (4) *Selecting the best course of action.*

b. Organizing. Organizing is the process of arranging facilities and resources in the most systematic and practical manner to get the job done. It is a continuous process and is essential to unity of effort. The three steps involved are—

- (1) Determining the job to be done.
- (2) Setting up the structure to do it.
- (3) Allocating required resources (time, space, materiel, and personnel).

c. Directing. Directing is essentially order-giving. Orders are issued verbally or in writing. They should be clear, concise, consistent

with their purpose, and within the capability of the individual or unit receiving the order.

d. Controlling. Control is essential and must include followup procedures (reports, inspections, etc.). The controlling function can be divided into three steps:

- (1) *Determining methods of control.* Determining where and to what degree controls are necessary and whether the supervisor should exercise complete control or delegate some authority to his subordinates.
- (2) *Establishing performance standards.* Establishing practical standards, considering the variables of materials, personnel, equipment, and operating conditions.
- (3) *Evaluating the results.* If actual performance differs from the expected, the important question is *why*. Pertinent data should be assembled and analyzed, and corrective measures taken.

e. Coordinating. The supervisor must coordinate his plans, policies, directives, and controls with all agencies or units affected. Coordination may be achieved by decree, but the most desirable method is by conference and agreement, followed by announcement. The manner in which the coordinating action is accomplished may determine the cooperation which follows.

4-3. Personnel Relations

a. Objective. The basic objective of personnel management is *maximum utilization of available manpower to achieve maximum efficiency*. The basic job of the maintenance supervisor is to maintain as many aircraft as possible in safe, flyable condition. To do this, the ground crew must work rapidly and efficiently. They must know their jobs, and must like and have pride in their work.

b. Obligations of Personnel. In a maintenance organization, each person is obligated to his associates, both legally and morally. Professional obligations involve the *individual* and the *supervisor*. Before a supervisor can adequately administer his supervisory obligations,

he must be aware of his obligations as an individual.

(1) *Individual obligations.* The success of the mission is ultimately determined by the performance of each individual in the organization. Each must—

(a) Subordinate his personal desires to those best for the organization.

(b) Be loyal to superiors.

(c) Show initiative. Personal ideas should be submitted through a suggestion box or in conference with the supervisor.

(d) Work compatibly with associates. This includes respecting the rights of others, advising and helping associates, being honest, and avoiding jealousy.

(2) *Supervisory obligations.* A supervisor must be able to think clearly and rapidly, talk convincingly, listen attentively, and discriminate between right and wrong conduct and good and poor work performance. Specific supervisory obligations include—

(a) Realizing that the organization is composed of a group of individuals, each wanting to be treated as an individual.

(b) Taking a personal interest in each man.

(c) Carefully considering job assignments and placements.

(d) Recognizing efficient performance. Publicly praising an individual for a job well-done stimulates good will and cooperation.

(e) Punishing the guilty, not the group.

(f) Developing initiative through the assignment of reasonable workloads, occa-

sional projects to be worked out by individuals, and added authority.

c. *Utilization of Personnel.* The five basic methods of using manpower wisely are—

(1) *Assigning the right man to the right job.* Personnel should be assigned the particular jobs they can do best consistent with their present level of training, then be further trained on the job.

(2) *Increasing availability of manpower.* Manpower availability depends upon health, safety, and reduction in absenteeism.

(a) A clean, dry, well-lighted working space with a comfortable temperature should be provided.

(b) Ground safety rules, and safe practices and procedures must be enforced.

(c) *Repairmen (military) must attend* specified classes, drills, physical training activities, etc. Work should be scheduled so that these absences will not disrupt operations.

(3) *Stimulating the will to work.* This can be accomplished by the supervisor's personal interest in the men, proper training and assignments, promotions, increased responsibilities, or written commendations.

★(4) *Increasing the ability to produce.* This is best accomplished through continuous training (on-the-job training if the man can produce while learning) and up-grade training (more responsible duties on larger and more complicated aircraft) for repairmen.

(5) *Fully utilizing a man on essential tasks.* This is achieved by scheduling a full day's work for each man.

★Section II. MOS STRUCTURE

★4-4. Military Occupational Specialty Code (MOSC) (AR 611-201)

The MOS code consists of five characters with each succeeding character providing more precise identification of the occupational characteristics of the job or individual.

a. *First Character.* This numeric character of the code represents the broad Occupational Area into which military jobs are classified for purposes of initial selection.

b. *Second Character.* This numeric charac-

ter, in combination with the first, identifies a career group.

c. *Third Character.* This alphabetical character, in combination with the first two characters, identifies the specific military occupational specialty (MOS) without regard to level of skill. In this code position, "A" identifies the entry MOS (EMOS), "B" through "Y" identifies the advanced MOS (ADV MOS), and "Z" identifies the capper MOS (CMOS).

d. *Fourth Character.* This numeric charac-

ter, in combination with the preceding three characters, indicates the various skill levels within the MOS.

e. *Fifth Character.* This alphabetical character identifies special qualifications. The character "O" will always be inserted here when a position does not require the identification of special qualifications and when an individual is not qualified for the award of a special qualifications identifier.

★4-5. Skill Levels

Levels of specialization and leadership are identified by the numbers "1" through "5" as the fourth character of the MOS code.

a. Skill level "1" identifies the apprentice job involving simple tasks performed under general supervision, or more difficult tasks requiring close supervision (*Example:* "Aircraft Maintenance Apprentice" (67A10).)

b. Skill level "2" identifies journeyman jobs involving difficult tasks that require general supervision. (*Example:* "UH-1 Helicopter Repairman" (67N20) (E-4); "Senior UH-1 Repairman" (67N20) (E-5); "UH-1 Crew Chief" (67N20) (E-5).)

c. Skill level "3" identifies advanced journeyman jobs involving tasks that are significantly different from, and in addition to, the tasks performed at the journeyman level requiring a minimum of supervision. (*Example:* "UH-1 Technical Inspector" (67N30).)

d. Skill level "4" identifies leader jobs involving relatively detailed knowledge of the tasks performed at all subordinate apprentice and journeyman levels in order to coordinate and give direction to work performed. (*Examples:* "Airfield Service Supervisor" (67N40) (E-5); "Maintenance Supervisor" (section chief) (67N40) (E-6); "Maintenance Supervisor" (platoon sergeant) (67N40) (E-7).)

e. Skill level "5" identifies supervisor jobs involving a broad, general knowledge of the tasks performed at all subordinate levels in order to coordinate and give direction to work activities. (*Examples:* "Detachment Sergeant," "Platoon Sergeant," or "Aircraft Maintenance Sergeant" (67Z50) (E-7); "Aircraft Maintenance Sergeant," "Operations Sergeant," or "First Sergeant" (67Z50) (E-8);

and "Sergeant Major" (67Z50) (E-9). The 67Z MOS as shown in AR 611-201 is titled "Aircraft Maintenance Supervisor.")

f. The above duty positions and grades in parentheses are extracted from "Standards of Grade Authorization" charts, AR 611-201. Standards of grade authorization (SGA) do not authorize positions; instead, they provide the basis for determining grades in all organizational tables after the number of positions and MOS classifications have been determined. The SGA duty position titles are not identical in all cases to the MOS title involved (i.e., MOS 67N "UH-1 Helicopter Repairman" is the MOS title for several typical duty position titles at various skill levels and grades within the 67N MOS structure).

★4-5.1. Aviation Enlisted MOS

a. AR 611-201 lists the duties, skills, and knowledge required of each MOS for enlisted men in all fields, including aviation maintenance. This regulation and AR 600-200, when used in conjunction with the unit TOE or TDA, will guide the maintenance supervisor in placing enlisted men in positions commensurate with their MOS qualifications.

b. School-trained repairmen MOS found at the organizational level are listed below. (These MOS's will also be found at direct and general support level since school training in these MOS's includes organizational, direct support, and general support aircraft maintenance.)

Duty Position	Code
O-1/U-6Airplane Repairman	... (67B20)
U-1AAirplane Repairman	... (67C20)
U-8/U-21Airplane Repairman	... (67G20)
OV-1Airplane Repairman	... (67H20)
OH-13/OH-23 Helicopter Repairman	.. (67M20)
UH-1Helicopter Repairman	.. (67N20)
CH-21/CH-34 Helicopter Repairman	.. (67P20)
CH-37Helicopter Repairman	.. (67T20)
CH-47Helicopter Repairman	.. (67U20)
OH-6Helicopter Repairman	.. (67V20)
CH-54Helicopter Repairman	.. (67X20)
AH-1GHelicopter Repairman	.. (67Y20)
(OH-58A)(Helicopter Repairman)	.. (67R20)

(Proposed)

c. As seen in paragraph 4-5c above, a skill level of "3" designates a technical inspector for a given aircraft associated MOS; i.e., a

67U30 MOS would be a CH-47 technical inspector. (The "U" designates the CH-47 aircraft and the "3" designates the technical inspector skill level for that aircraft.) Personnel with the "3" skill digit are not school-trained technical inspectors, but are qualified through OJT. However, service school courses are available for two technical inspector MOS: 67F20 (Airplane Technical Inspector) and 67W20 (Helicopter Technical Inspector). The Airplane Technical Inspector is qualified to inspect all fixed wing aircraft. The Helicopter Technical Inspector is qualified to inspect all rotary wing aircraft.

★4-6. Proficiency Pay

Proficiency pay is awarded in accordance with AR 600-200 based on the results of the Enlisted Evaluation Report and the annual MOS evaluation test.

4-7. Awarding a Higher MOS

This award should not be made solely to commend a man for faithful work. Such action could prove detrimental to the repairman if he cannot complete the proficiency pay test for his new MOS. In that case, he will be more valuable to the unit working in a position for which he has been trained. The award of a higher MOS in the field should be given careful consideration.

★a. The enlisted repairman can further his knowledge of aircraft maintenance and become qualified to maintain aircraft in other than his MOS skill level or category through on-the-job training, units, schools, or experience. Repairman being considered for award of higher MOS skill levels should be tested on their ability to perform new MOS duties.

★b. When the maintenance officer is convinced (after studying the duties, skills, and subject matter of a higher MOS in AR 611-201 and observing the repairman's work) that a man has demonstrated his ability to perform in a higher MOS, he should take necessary steps through channels to recommend the repairman for the higher MOS. DA Form 2496 should be prepared giving the man's name, rank, rating, service number, current MOS, the recommended new MOS, and the length of time he

has worked in the higher position. This form should be signed by the supervisor and forwarded through the company commander to the personnel officer who maintains the repairman's DA Form 20.

4-8. Secondary MOS

★Whenever a repairman is awarded a new MOS, his previous MOS should be recorded as one of his secondary MOS's. This will prevent the loss to the maintenance system of the skill held in the secondary MOS (AR 600-200).

4-9. Awarding a Skill Character

★a. The same procedure outlined in paragraph 4-7 is used to award or change a repairman's skill-level (fourth character). This character indicated either the appropriate level of technical skill (specialist) or supervisory leadership ability (NCO) possessed by the holder of the MOS. Skill level will be awarded only to indicate the actual level of skill attained by the repairman—not to reflect his pay grade or the skill-level character indicated on the TOE or TD.

★b. A higher skill-level character may be awarded after satisfactory performance of duty in a position requiring the higher skill level. Any repairman assigned to a lower level of skill than that indicated by his primary MOS will retain the higher character as long as he remains qualified.

4-10. Lowering a Skill Character

A skill-level character may be lowered by the appropriate company or unit commander or supervisory staff officer when it is determined that he is not qualified at that skill level. The NCO status (skill levels 4 and 5) implies leadership qualities which may be nullified by disciplinary action. The skill-level characters which indicate NCO status may be withdrawn when the NCO status is withdrawn. The supervisor should read AR 600-200 with care before initiating any action along these lines.

4-11. Withdrawing an MOS

An MOS may be withdrawn (AR 600-200) because of—

a. Erroneous entry of an MOS on the soldier's qualification record.

b. Physical inability to perform the duties of the MOS.

★c. Inefficiency in the performance of the duties of the MOS. Action to withdraw an MOS or lower a skill character because of inefficiency must be approved by the company commander and the repairman concerned. If the repairman's approval cannot be obtained, the case will be referred to a classification board consisting of three officers—the unit personnel officer or a personnel management officer, an officer representing the training or personnel section of the appointing authority, and an officer with knowledge of the technical requirements of the MOS. The appointing authority can approve or disapprove the findings of the board, terminate the proceeding, or order a rehearing of the case.

d. Disciplinary action. Normally withdrawal is not accomplished in this case because such action usually does not affect a soldier's qualifications or ability to perform in an MOS.

e. Obvious disuse or disinterest in secondary and additional MOS.

f. Lack of security clearance required in the performance of duties normally associated with the MOS.

g. Appointment as a noncommissioned officer or a specialist pay grade which is not commensurate with or authorized for previously held MOS.

h. Reduction in grade under the provisions of UCMJ or AR 600-200.

i. Failure to achieve an MOS qualification score of 70 or higher when tested in the MOS.

CHAPTER 5

ORGANIZATIONAL MAINTENANCE OPERATIONS

Section I. ORGANIZING TO PERFORM MAINTENANCE

5-1. General

a. Organizational maintenance is that maintenance which is performed by a using organization on its own equipment as authorized by the appropriate maintenance allocation chart. It mainly consists of preventive maintenance, to include—

(1) Inspecting, cleaning, servicing, preserving, lubricating, and adjusting, as required.

(2) Replacement of minor parts not requiring highly technical skills.

(3) Computing, requesting, and storing the prescribed load of spare parts.

★*b.* Organizational maintenance usually is performed by the repairmen of the service platoon or other maintenance sections, assisted by the assigned crew chiefs. Normally, the crew chief will perform all organizational maintenance on his aircraft which is within his capability and which can be accomplished with his own tools. When the maintenance required exceeds his ability, or requires additional skills or tools, this maintenance will be performed by the service platoon or higher maintenance units.

★*c.* Work performed by the repairmen and crew chiefs must be closely coordinated to insure that effective and efficient organizational maintenance is performed. Requirements for special tools and equipment are directly related to the type and number of aircraft maintained by the unit, and to the category of maintenance performed. Authority for organizational tools and equipment is contained in the -20P (organizational maintenance repair parts and special tools list) for each type of aircraft or engine. Each unit is required to have the authorized special tools and equipment, and the prescribed load of parts at all times.

5-2. The Service Platoon or Maintenance Sections

a. Mission.

(1) The service platoon or maintenance sections (hereafter referred to as service platoon) normally provides organizational maintenance for organic aircraft and wheeled vehicles, communications and sensor equipment, aircraft parts resupply, refueling service, and limited armament kit maintenance. The mission of the platoon may vary, depending on the type of unit and the equipment maintained.

(2) Specific duties of the platoon which are directly related to aircraft maintenance and supply include—

(a) Performing organizational aircraft maintenance for the company, assisted by the crew chief of the specific aircraft.

(b) Requesting and stocking aircraft repair parts, tools, and related supplies.

(c) Performing aircraft technical inspections and insuring quality control in all maintenance performed.

(d) Assisting in the performance of scheduled inspections of the assigned aircraft.

(e) Performing aircraft refueling, servicing, and crash rescue operations at the company airfield.

(f) Preparing job requests for support maintenance and insuring that organizational deficiencies are corrected before aircraft are released to support units.

(g) Receiving aircraft from support maintenance after checking the forms and records, the work performed, and the completeness of accompanying equipment.

b. Organization. The service platoon is usually located at the company airfield near the company headquarters. It normally consists of

a platoon headquarters, an aircraft maintenance section, a communications maintenance section, and an airfield service section.

(1) *Platoon headquarters.* The platoon headquarters contains the aircraft maintenance office, the wheeled vehicle maintenance section, and the aviation technical supply area.

(a) *The aircraft maintenance office.* The maintenance office is normally located in a tent, a maintenance hangar, or a shop van. The physical layout is determined by the mission and facilities of the particular maintenance organization. To facilitate aircraft maintenance, necessary records, files, technical manuals, and other pertinent material are filed in this office. These serve as a ready reference for officers, inspectors, supervisors, mechanics, and clerks in planning and scheduling duties and workload, and in evaluating work already performed. A complete technical reference file on all aircraft on which the unit may perform maintenance is located in this area, and is available to supplement the records which accompany each aircraft. A specific place must be provided where these references may be studied. Personnel located in this office are the platoon leader, who is also the aircraft maintenance officer; the platoon sergeant; the technical inspectors; and the shop clerk.

(b) *Wheeled vehicle maintenance section.* It provides organizational maintenance for organic wheeled vehicles. It will normally be located in the same general area of the company headquarters. The tactical situation will dictate the degree of dispersion required. Personnel assigned to this section include a motor sergeant, wheeled vehicle mechanics, and helpers.

★(c) *The aviation technical supply area.* This area includes the office of the technical supply officer (additional duty), and the parts and equipment storage area and issue point. It should be located close to the aircraft maintenance area so it will be readily accessible to the aircraft repairmen. It is desirable to have the spare parts and tools in the hangar where the maintenance is performed; however, they may be located in adjacent buildings, tents, or shop vans, if available. In no case should its location create a hardship on the repairmen and

require excessive travel time to and from the area.

(2) *Aircraft maintenance section.* The aircraft maintenance section is located in the area which will be the most desirable for conducting maintenance. This may be a hangar, tent, or other suitable shelter, or may be out in the open if no shelter is available. It must be accessible to all types of aircraft maintained by the service platoon, and must have a parking and runup area closely available. Organizational maintenance repairs and inspections beyond the capability of the crew chief will be performed in this area. The aircraft maintenance technician, assisted by the maintenance supervisor, controls the operation on this section.

(3) *Communications maintenance section.* The communications maintenance section consists of the communications chief and sufficient communications repairmen to perform the organizational maintenance on all communications equipment assigned to the company. This section should be located near the aircraft maintenance section so that communications equipment inspections and repairs may be accomplished at the same time that organizational maintenance is being performed on the aircraft.

(4) *Airfield service section.* The airfield service section consists of an airfield service chief and personnel to provide crash and rescue service, refueling service, parking and mooring service, and general assistance to aircraft using the airfield. A truck equipped with firefighting and rescue equipment and an FM radio is on continuous standby in the vicinity of the control tower. When this vehicle is dispatched from the airfield for crash and rescue purposes, it is augmented by a detail from other sections of the company. The airfield service section is equipped with fuel servicing trucks for servicing aircraft on the Army airfield. A $\frac{3}{4}$ -ton truck is required to transport, install, and maintain a field lighting set. Additional personnel to assist the airfield service section may be detailed from other elements of the company when required.

5-3. Methods of Performing Maintenance

a. General. There are several methods of performing maintenance on assigned aircraft. Each unit should select the method or combination of methods best suited for its requirements. Factors to be considered in selecting a maintenance system include—

- (1) Size and mission of the maintenance organization.
- (2) Type and number of aircraft to be maintained.
- (3) Flying schedule.
- (4) Skill and experience of available personnel.
- (5) Available hangar and equipment facilities.
- (6) Climatic conditions.

b. Dock. The dock method is a system by which inspections are made and maintenance of aircraft is accomplished at fixed docks equipped with workstands and testing apparatus. Specially trained crews move from dock to dock on a time schedule basis to accomplish their specific missions. When uncowed and cleaned, the aircraft is moved to the fixed location where it remains until inspection is completed. The dock method is designed to—

- (1) Utilize inexperienced personnel to the best advantage while developing their skill through a progressive on-the-job training program.
- (2) Reduce the number of men necessary to maintain any given number of aircraft.
- (3) Reduce the amount of equipment necessary for maintenance, and to fully utilize available equipment.
- (4) Improve the condition of the aircraft through frequent maintenance and standardized inspections.

c. Production Line.

(1) *Description.* The production line method of maintenance is different from the dock method, in that the aircraft instead of the crews move from station to station. As the aircraft arrives at each station, specialists assigned to the station perform their specific checks and repairs in an allotted time. When the allotted time has elapsed, the aircraft is moved to the next station. If the work has not

been completed, a "pad" crew (experts on maintenance performed at all stations) finishes the work at the succeeding station.

(2) *Considerations.*

★(a) *Breakdown of operations.* Logically, a repairman should be assigned work on stations that are closely related and located in one area of the aircraft. Inspection and maintenance guides are valuable aids to job breakdown.

(b) *Estimate of time per operation.* After observing the time spent on each operation, an estimate of the time required is made.

(c) *Sequence of operations.* The maintenance and the inspections are divided so that one does not interfere with the other.

(d) *Assignment of personnel to crews.* Personnel are distributed so that all operations can be completed within the same time interval.

d. Crew Chief.

(1) *Description.* The crew chief method of maintenance uses the crew chief as the specialist on his aircraft. He must be thoroughly familiar with the aircraft and with the status of maintenance. This method is most practical in small units. The crew chief is assisted in the inspection and repair of his aircraft by the assigned mechanics.

★(2) *Inspections.* When an inspection is due, the aircraft will be brought to the service platoon maintenance area. An inspection crew made up of repairmen from the service platoon will be assigned to help the crew chief perform the inspection. The crew chief has first hand knowledge of the aircraft and existing faults. This close contact with, and thorough knowledge of the aircraft enables the crew chief, assisted by the inspection crew to complete a thorough inspection in a minimum amount of time. The aircraft may be located in any desirable location and may be moved if required.

Note. This method is most often used at the organizational level.

e. Progressive.

(1) *Description.* Progressive maintenance is that method in which scheduled maintenance is performed between scheduled flights, thereby increasing aircraft availability.

(2) *Considerations.*

(a) The inspection worksheets or cards must be grouped into stations on the aircraft so that once the cowl is raised on an aircraft for inspection, all necessary tests and inspections for that requirement will be performed in progressive sequence.

★(b) Whenever the aircraft is on the ground for even an hour, the crew chief or repairman must have necessary inspection workcards available, and should perform whatever maintenance is possible at the particular station in the time allowed. When necessary maintenance has been completed, cards are initialed and aircraft time entered in the appropriate places by the crew chief or repairman.

(c) The progressive maintenance program will be closely supervised so that all components or parts of the aircraft are inspected within the prescribed time limit.

★(d) A red dash will be entered in the "status today" column during inspection; the column for aviator's and repairman's remarks will explain that the inspection is in progress.

(e) When an inspection requires the disassembly of a component, it should be done as rapidly as possible during a time when the flight schedule for the aircraft permits.

(f) Maintenance accomplished on each aircraft must be accurately recorded to insure that no inspection phase has been omitted.

5-4. A Unit-Type SOP

a. A standing operating procedure (SOP) is

a set of instructions for a particular unit describing routine operational features, both tactical and administrative. SOP's reduce the number and length of orders that must be issued. For sample outline, see appendix II.

b. Standing operating procedures for service platoons are designed to—

(1) Simplify the preparation and transmission of orders.

(2) Simplify and perfect unit training.

(3) Promote understanding and teamwork between the commander, staff, troops, and other units.

(4) Facilitate and expedite operations, and minimize confusion and errors.

c. SOP's are printed in the most effective and convenient form and are changed when necessary. They may be issued as a single pamphlet; as several pamphlets, each pertaining to a separate operation; or in looseleaf form. A service platoon SOP should contain information on—

(1) Maintenance operations.

(2) Liaison with field maintenance.

(3) Aircraft and vehicle accidents.

(4) High wind and storm procedure.

(5) Evacuation plan.

(6) Inspections.

(7) Reports and records.

(8) POL procedures.

(9) Requesting procedures.

(10) Issue and turn-in procedures.

(11) Shop and line safety.

(12) Other subjects as required.

Section II. MAINTENANCE SCHEDULING

5-5. General

Maintenance scheduling, which is the responsibility of the unit maintenance officer, is necessary for high maintenance standards and efficient flight scheduling. It becomes more important when experienced maintenance personnel or facilities are limited. Administrative planning, if conducted properly, improves maintenance.

a. The basic requirement for scheduling aircraft maintenance is to control overall aircraft flying time so that the scheduled maintenance on aircraft is completed with as few aircraft grounded as possible.

★b. Mutual coordination between the operations officer and the maintenance officer must be effected on a continual basis, so as to provide the number of aircraft needed to meet mission requirements and to simultaneously permit adequate time for maintenance.

5-6. Preventive Maintenance

Preventive maintenance is the first priority of organizational maintenance units. Replacement of parts and assemblies and minor repair, as authorized by the pertinent maintenance allocation chart (MAC), will be the prime mission.

a. To perform his job well and to obtain a

high aircraft availability, the organizational maintenance officer should insure that aircraft not flying are undergoing maintenance. This requires close supervision.

(1) When the aircraft is shut down, it should be serviced immediately for fuel and oil.

(2) The crew chief will check the pilot's remarks on DA Form 2408-13 for any faults found during flight, and will correct them on the spot if practicable.

★(3) The DA Form 2408-14 will also be checked to see if any delayed faults can be corrected during the downtime available.

(4) A technical supply check will be conducted to determine the status of parts on request.

★b. If DA Forms 2408-13 and 2408-14 contain no faults which can be corrected, the crew chief or repairman should use available time to visually inspect those parts of the aircraft likely to cause trouble. Faults are determined from aircraft maintenance experience, based upon a knowledge of the existing mission, terrain, and climatic conditions. Careful inspection of the aircraft at every opportunity simplifies preventive maintenance.

★c. During downtime, the crew chief or repairman should check to determine when the next scheduled periodic inspection is due. If the periodic inspection is due within 2 or 3 hours, phases of the inspection that do not require teardown of a component may be completed. The aircraft, however, should remain available for flight on short notice.

5-7. Inspections and Component Changes

a. Inspections.

★(1) TB 55-1500-301-25 prescribes the authorized inspection procedures to be used by individuals and activities operating and maintaining Department of the Army aircraft. It contains a brief description of each type inspection and prescribes the intervals at which they will be performed. These intervals should not be exceeded. Under unusual conditions of environment, utilization, mission, etc., the maintenance officer will increase the scope and/or the frequency of inspections. The maintenance officer is not authorized to increase the

interval between inspections nor decrease their scope, except under emergency conditions.

(2) The aircraft inspection requirements appear as inspection checklists in the -20 PMD, PMI, and PMP for each type aircraft. These TM's contain detailed inspection checklists for preventive maintenance daily, preventive maintenance intermediate, and preventive maintenance periodic inspections. Special inspections are contained in the -20. They do not contain instructions for repair, adjustment, etc. These instructions are found in the -20 (organizational aircraft maintenance manual). Each item is numbered in accordance with the area sequence method; the inspection should be performed in accordance with this method. This allows maintenance personnel to completely inspect all items within a given area before moving to another area, thus permitting a thorough and progressive inspection around the aircraft.

(3) An effective inspection system is based on staggering aircraft time in order to maintain a reasonable number of aircraft available for missions at all times. In order to accomplish this and to perform all maintenance inspections at the prescribed time, the maintenance officer must be familiar with the inspection status of each aircraft and know the hours which can be flown before the next inspection is due. There are many methods which can be used to make this information available to the maintenance officer. Some units post this information on aircraft status charts or locally produced forms, while others construct bar graphs which compare the times on all of the aircraft assigned to the unit. Any method is satisfactory which meets the needs of the unit and enables the maintenance officer to achieve a workable system of inspections.

b. Component Changes.

★(1) When planning the scheduling of component replacements, TB 55-1500-300-25 should be consulted.

(2) If the component is to be changed by the support maintenance activity, the unit supervisor must coordinate with support maintenance to insure that the parts to be changed will be on hand when the aircraft is scheduled, and that sufficient time is allowed for support

maintenance to prepare for the job. By scheduling the aircraft to support maintenance so that, within safety limits, maximum component operating time can be realized, the unit is practicing economy of supply and helping to raise the operating time limit of the component (as determined by study of the service life of repair parts by higher levels).

★(3) Time or calendar-change components must be ordered in advance of their scheduled replacement date if they are to be available when the change is due. On those items not in the "critical items" list, a stated amount of time freedom (TB 55-1500-300-25) is allowed for changing the components. Parts not ordinarily stocked should generally be ordered 45 days in advance of need. The average amount of flying time per day for the aircraft involved will largely determine (by converting the aircraft flying-hour-remainder into days) when the parts should be ordered.

5-8. Inspection and Repair Only as Needed (IROAN)

★*IROAN* is that maintenance technique which determines the minimum repair necessary to restore equipment, components, or assemblies to prescribed maintenance serviceability standards by using all available diagnostic equipment and test procedures, and by minimizing disassembly and parts replacement. IROAN is applicable to all categories of maintenance. IROAN principles are outlined in AR 750-5. Aircraft requiring extensive maintenance are nominated on a condition basis by the commanders for input to depot maintenance. Once nominated, the aircraft is given a thorough inspection by support maintenance personnel and a DA Form 598 (Disposition of Army Aircraft) is submitted in accordance with TB 23-8 to the U.S. Army Aviation Materiel Command (USAAVCOM) giving all pertinent information relative to aircraft condition and work requirements. Based on analysis of this report, the aircraft is scheduled into the appropriate maintenance facility for repair. Transfer of accountability to USAAVCOM normally will occur on aircraft undergoing extensive depot repair.

5-9. Deferred Maintenance (Negligible Damage)

a. In the past, numerous cracks, dents, scratches, or wrinkles in the aircraft skin or component parts have either been repaired or parts removed which could have been considered as *negligible damage* and continued in service. Small dents and wrinkles noted during inspection will be written up on the DA Form 2408-13 as faults, and may be transferred to the DA Form 2408-14 and corrected at the next scheduled inspection.

★b. *Negligible damage* is damage or distortion which may be permitted to exist or may be corrected by simple procedures. This may include removing dents, stopdrilling cracks, or temporarily patching, without placing a restriction on flight.

(1) Negligible damage is considered deferred maintenance and is a responsibility of organizational maintenance.

(2) If feasible, negligible damage will be deferred until the time of scheduled maintenance.

★c. To insure flight safety, care must be exercised in classifying any damage as negligible. Deep skin wrinkles of undetermined origin are not classified as negligible until the source of the damage has been determined. A thorough inspection must be made to ascertain any possible damage to adjacent areas. Abnormal stresses incurred by shock or impact forces may be transmitted to the extremity of the structural members, resulting in secondary damage such as sheared or stretched rivets. Points of attachment must be examined for distortion and security of fastenings in primary and secondary damage areas.

★d. No fault suspected as a safety of flight factor will be considered deferred maintenance (TM 38-750). Since the dividing line between a red diagonal and a red X condition is often indistinct, the maintenance officer must exercise caution. He must ground the aircraft if there is a reasonable doubt of flight safety. This doubt may include the inability to obtain prompt enough advice from a higher category of maintenance. Any fault that *could* become dangerous by continued use will be considered a red X condition.

5-10. Unscheduled Maintenance

a. Unscheduled maintenance is that maintenance which cannot be predicted. Unexpected aircraft difficulties or emergencies may occur which require prompt correction. Immediate action technical compliances may be received which will ground all aircraft of a particular type until complied with.

★b. If a needed part is not in stock or cannot be obtained through exchange in a short time and if the mission justifies, the part can be removed from an unserviceable aircraft or aircraft components (AR 750-50). In the field or in combat, when supply lines are temporarily out of commission or supplies are delayed en route, the ingenuity of maintenance personnel should be used to increase the availability of aircraft.

c. If the unit receives an order to move on short notice, the maintenance officer or the unit commander must evaluate the condition of the aircraft and insure that they will not be left for salvage. An aircraft can be in a red X condition and still be safe for a *one-time flight*.

5-11. Maintenance Coordination

a. *Coordination With Operations.* By keeping himself well informed of the inspection status of the assigned aircraft, the maintenance officer can foresee the probability of major inspections coming due for two or more aircraft at or near the same time. In order to prevent this, he must maintain close contact and coordination with the unit operations officer. The maintenance officer should furnish operations with continuous reports on aircraft status, availability, and hours to major inspections. Based on this information, the operations officer should coordinate flight scheduling with the maintenance officer in order to meet the operational requirements of the unit and provide adequate time for the accomplishment of organizational maintenance. A proper working relationship between the two should enable both of them to accomplish their mission without undue strain on either section, and increase the overall efficiency of the unit. Lack of cooperation can create an increased workload for the maintenance section and lower the aircraft availability to an unacceptable level.

b. *Coordination With Support Maintenance.* Close cooperation between organizational and support maintenance units will alleviate many difficulties between them and effect a smooth, well organized maintenance operation. Organizational units can expedite this maintenance operation by correct preparation of maintenance requests and completion of all organizational maintenance before evacuating an aircraft to support maintenance installations. The aviation unit commander and the commander of the supporting aircraft maintenance company plan jointly in determining requirements for aircraft maintenance and supply support, and in establishing insofar as possible, a mutually acceptable schedule of aircraft into the support activity. Subsequently, should either commander foresee a possible deviation from the established plan, he should immediately advise the other, and the two commanders should coordinate in making necessary adjustments. Such planning—

★(1) Enables the aviation unit commander to better plan and manage his organizational maintenance.

★(2) Enables the supporting unit commander to plan and manage the support workload, to anticipate repair parts requirements, and to make timely requests for assistance when needed.

(3) Contributes to more rapid repair and return of equipment to the user.

(4) Enables the aviation unit commander to more accurately predict the availability of operational aircraft that can be sustained over a given period of time.

★c. *The Technical Assistance Program.* Technical assistance in the maintenance support of Army aircraft may be requested by commanders under the provisions of AR 750-5. The purpose of the program (AR 700-4) is to provide maintenance advice, assistance, training guidance, and instruction for equipment operation and maintenance and to provide feedback of equipment performance data. The personnel involved are employed by the commodity commands of the Army Materiel Command.

(1) *Maintenance specialists and commodity command personnel.*

(a) *Maintenance specialists.* These are either military or Department of the Army civilians, who are technically qualified to provide installation, operation, and operation "know how" on particular categories or items of equipment.

(b) *Commodity command personnel.*

1. *Manufacturer's representative.* A manufacturer's representative is an employee of an industrial or commercial company who is specially trained in the installation, operation, and maintenance of an item of equipment or system manufactured by his company.

2. *Field technicians.* Field technicians represent the Government as advisors on the installation, operation, and maintenance of equipment, not necessarily the product of one manufacturer.

3. *Technical instructor.* These instructors teach installation, operation, or maintenance of equipment use or supported by the Department of the Army.

(2) *Field service representative.* A field service representative is an employee or a manufacturing or commercial company who provides both company administration for technical services personnel and liaison between his company and the U.S. Army at no direct expense to the Department of the Army.

5-12. Weight and Balance

★*a. General.* Weight and balance becomes increasingly important as aircraft load capacity is increased. Many aircraft accident investigations have revealed inaccurate use of weight and balance data by operating personnel. Support maintenance is responsible for weighing Army aircraft; the unit commanding officer, maintenance officer, and the individual Army aviator are responsible for the maintenance and computation of weight and balance data in accordance with AR 95-16.

b. Unit Responsibility for Weight and Balance Data. The maintenance officer should schedule his maintenance in such a manner that the aircraft in his organization come due for weighing at spaced intervals rather than all at once. He should strive to have the weighing accomplished when the specific aircraft is undergoing scheduled support maintenance

work. Although weighing the aircraft is a support maintenance mission, the organizational repairmen must be aware of the changes that are recorded when the basic weight of the aircraft changes. Basic records that must be changed or checked before and/or after weighing the aircraft are the DD Form 365 (Record of Weight and Balance Personnel), DD Form 365A (Chart A—Basic Weight Checklist), DD Form 365B (Aircraft Weighing Record), DD Form 365C (Chart C—Basic Weight and Balance Record), and DD Form 365F (Weight and Balance Clearance Form F). For instructions in filling out these forms, see TM 55-405-9.

★*c. Weight and Balance Technicians.* Commanding officers of units operating, maintaining, repairing, or modifying Army aircraft will be responsible for appointing a weight and balance technician within his unit. These technicians are personnel who are thoroughly familiar with procedures for computing weight and balance for Army aircraft, weighing of aircraft for weight and balance purposes, and forms and records associated with the maintenance of weight and balance data for Army aircraft. Weight and balance technicians may be officers, enlisted men, or civilians and they will perform the related functions thereof in conjunction with other regularly assigned duties. The weight and balance technicians will execute, essentially, the following duties:

(1) Maintain up-to-date records of weight and balance for all aircraft under their jurisdiction.

(2) Comply with weight and balance provisions of applicable modification work orders or technical manuals pertaining to aircraft modifications.

Note. A record should be maintained of those modifications for which weight and balance action is not required. The accumulation of such modifications may require adjustment of the weight and balance data.

(3) Assist pilots in the use of the weight and balance data and the balance computer and prepare sample loadings which may be used by the pilots to simplify their work in this connection.

(4) Prepare and maintain for each class 2 aircraft a DD Form 365F for each loading arrangement that would be utilized. To expedite aircraft loading and clearance, standardized loads can be established for specific aircraft using the procedures set forth in AR 95-16. (Care should be exercised in using data from the DD Forms 365C and 365F of one aircraft to prepare the DD Form 365F for another aircraft of the same type. Differences in installed equipment or modifications may invalidate such data. When this occurs, the completed DD Form 365C for the individual aircraft must be used for computations.) Duplicate copies of the DD Form 365F will be retained in the weight and balance manual (TM 55-405-9), for possible future reference as outlined in AR 95-16. These forms should be checked for accuracy every 90 days and redated if no changes are involved. All copies of DD Form 365F will be destroyed or marked void in the event of any change in the basic weight and balance of the aircraft.

d. Direct Support Maintenance Responsibility. Direct support maintenance activities will have the following duties and responsibilities:

(1) Weigh each class 2 aircraft under their jurisdiction at least once a year, or more frequently if deemed necessary, to insure that the applicable weight and balance forms show accurate and current data.

(2) Weigh one representative aircraft of each of the various types of class 1 aircraft under their jurisdiction at least once a year, or more frequently if deemed necessary, to insure that the applicable forms show accurate and current data, and that the loadings usually employed are satisfactory for safe flight.

(3) Have the aircraft weighing equipment under their jurisdiction tested for accuracy in accordance with pertinent technical manuals at the intervals required.

(4) In the event equipment and personnel are not available at the direct support activity, arrangements will be made to weigh aircraft

at general or depot support activities, on a cross-service basis by other Department of Defense services, or by contractual agreement.

5-13. Planning Factors

Planning factors for maintenance scheduling, flying hours, aircraft capabilities, and accessory replacement can be found in supply bulletins, special regulations, field manuals, and technical bulletins, as indicated below.

a. Supply Bulletin 1-1. SB 1-1 as modified periodically by DA letters, provides annual program factors and data for all Department of the Army personnel concerned with supply, maintenance, procurement, inventories, distribution, provisioning, budgeting, and operation of Army aircraft and allied equipment. It establishes planned annual Army aircraft flying hours (for programming depot, support, and organizational maintenance) and gives a basis for evaluating actual hours performed. Periodic DA letters redefine the program base for developing annual flying hour factors for each type, model, and series of aircraft.

b. Field Manual 101-10-1. FM 101-10-1 is a planning guide and provides planning data for staff officers of all echelons. It provides the commander with general planning factors for the Army aircraft in his command; it lists characteristics of Army aircraft and gives planning factors for figuring the availability of aircraft, requirements for landing sites, and loading and unloading times.

★*c. TB 55-5100-300-25.* TB 55-1500-300-25 establishes procedures within the Department of the Army for the replacement and reuse of aircraft components with the general principle of *maximum utilization of aircraft components in consonance with the economic operation of the aircraft*. The bulletin takes flight safety into account and is an important aid to the maintenance supervisor who is scheduling the replacement of component parts of an aircraft.

Section III. MAINTENANCE UNDER COMBAT AND OTHER CONDITIONS

★5-14. General

The mission of the Army, as a part of the Armed Forces of the United States, is to provide for the security of the United States and for the support of its national and international policies. To accomplish this mission, the Army must be ready, at all times, to undertake land combat operations and sustain them indefinitely. Tactical training under simulated combat conditions will insure that aircraft maintenance personnel are prepared to operate efficiently under actual combat conditions. Only the highest standards of maintenance are acceptable in combat; close supervision in training is necessary to insure that proper habits and high standards will be carried by individuals into later situations. Stability operations are in an environment which appears peaceful on the surface, particularly in seemingly secure airfields, metropolitan military installations, and supply points. Such appearances tend to lull combat service support personnel into a false sense of security. The fact is, there are no secure areas.

★5-15. Employment

In combat, to include stability operations, the service platoon should be employed in a manner which will enable it to keep the maximum number of aircraft flyable at all times. This will require that maintenance personnel be capable of performing the required maintenance during darkness, adverse weather conditions, and during actual combat.

a. Principles of Employment.

(1) The service platoon normally is employed under centralized control of the maintenance officer.

(2) Organic special tools and groundhandling equipment for aircraft maintenance normally are pooled at the service platoon and delivered to satellite airfields as required.

(3) To insure adequate maintenance operation and support, the maintenance officer or assistant maintenance officer uses an aircraft for liaison with the flight platoons operating from the satellite airfields.

(4) Urgently needed aircraft parts and supplies are transported to the satellite airfields by the best available mode of transportation.

b. Factors Affecting Employment. The typical service platoon of the aviation company is organized and equipped to perform organizational maintenance in the field, with supporting maintenance accomplished by *Transportation Aircraft Maintenance Companies* (DS or GS). Factors which affect the employment of these units include the—

(1) *Distance of flight platoons from the aviation company airfield.* The maintenance officer must maintain close contact with flight platoons operating independently or from distant airfields if he is to program maintenance requirements wisely.

(2) *Ability of flight platoons to perform necessary maintenance.* When maintenance requirements of the flight platoons cannot be met with available tools, either the aircraft must be flown to the service platoon area for the maintenance or the necessary tools, equipment, and specialists must be flown to the flight platoons. Although greatest efficiency is obtained by centralized maintenance operations, a supply of special tools and groundhandling equipment should, when practicable, be added to the maintenance capability of platoons operating independently or from satellite airfields.

- (3) *Flexibility of maintenance scheduling.* Maintenance scheduling must provide for the performance of other duties such as manning the perimeter of defense of the airfield. As a principle, however, additional duties must be subordinate to aircraft maintenance duties; the supervisor must exert judgment under conditions which place these dual obligations under severe test.

5-16. Location

Organizational aircraft maintenance facilities should be centrally located at the airfield or airstrip on a well-drained, hard surface. An area should be selected which is easily accessible from routes of communication and which can be camouflaged quickly. Although limited organizational aircraft maintenance is possible in the parking area, most of it will be performed in the maintenance area where special tools, compressors, power generators, and test equipment are accessible.

5-17. Protection From Elements

The organizational aircraft maintenance officer must adapt the equipment to the situation and use available shelter, tents, tarpaulins, etc., to best advantage. A tarpaulin set on poles over a work location provides some shelter from the sun or rain. Maintenance shelters available to most units can be adapted to most weather conditions.

5-18. Camouflage

Camouflage discipline is the responsibility of the unit commander. Since organizational aircraft maintenance installation and Army aircraft receiving maintenance are vulnerable to enemy attack, all means of concealment and camouflage must be used. All reflective areas on the aircraft, including windshields, insignia

areas, propellers, etc., will be covered with burlap or canvas if suitable concealment is not available. Tools and equipment with reflective qualities will be kept under cover. Only the aircraft actually receiving maintenance will be parked in the maintenance area. Other aircraft will be well dispersed. Because of the difficulty of concealment in the maintenance area, strict camouflage discipline is essential.

5-19. Maintenance During a Move

Maintenance activities are organized to keep the maximum number of aircraft flyable. Schedules must be planned so that, if ordered to move on short notice, no aircraft need be left behind because of a nonflyable status. Aircraft disassembled for maintenance to the extent that reassembly cannot be completed in time to comply with movement order will be evacuated to the field maintenance activity. Evacuation may be accomplished by several means, including using a lowboy, towing by vehicle, or helicopter airlift. FM 1-100 describes evacuation of aircraft in detail. Close coordination will be maintained between the organizational aircraft maintenance officer and the support maintenance activity.

5-20. Night Maintenance

Night maintenance is particularly important during extended commitment of aircraft during combat, counterinsurgency, or field exercises. Factors to be considered in performing night maintenance are—

- a. Location of the airstrip.
- b. Friendly air superiority.
- c. Available cover and defilade.
- d. Satisfactory light facilities.

Note. When one or more of the above factors are unfavorable, defective parts, subassemblies, or assemblies may be removed from the aircraft during daylight hours, overhauled, repaired, and tested at night in a light-proof shelter, and replaced on the aircraft during the day.



1

2



3

4



CHAPTER 6

AIRCRAFT MAINTENANCE TRAINING

6-1. General

★The aircraft maintenance officer is responsible for the instruction and training of personnel in maintenance and repair of Army aircraft. As the complexity of aircraft and components increases, the required skill of the mechanic must also increase. Therefore, training becomes more important with each new item of equipment introduced into the system. Because of the technical nature of aircraft maintenance training, it is desirable for all aircraft repairmen to be service school trained. However, school training does not reduce the need for training in the unit. Maintenance training must be a continuous process. The individual must be further trained in his primary MOS while being cross-trained in other skills and MOS's; e.g., cross-training of aircraft maintenance personnel in supply procedures promotes greater understanding and efficiency, and creates a reserve of personnel in the supply field. Objectives, responsibilities, and concepts of military training are covered in FM 21-5.

6-2. Methods of Training

★The two primary methods of training aircraft repairmen are *service school training* and *on-the-job training*.

★*a. Service School Training.* The most effective method of training aviation repairmen is through formal courses of instruction taught in the Army school system. DA Pam 350-10 contains general information on the school training program of the Army, an alphabetical list of all courses, and detailed information concerning each course. It also shows the location of each training agency, and includes information on available housing and messing facilities and other information concerning the training agencies.

(1) *Selection of individuals for service school training.*

★(a) AR 600-200 governs the selection of active service enlisted personnel for training at Army service schools. Quotas are issued to appropriate commands by the Department of the Army, either by allocation letters or by periodic quota circulars. Requests for additional quotas may be submitted to Department of the Army in accordance with AR 350-5. Units should take full advantage of their school quotas so they can have a ready source of expertly trained replacements for critical specialist positions.

★(b) Knowledge, craftsmanship, and integrity are the characteristics of a good aviation repairman. Moral prerequisites for an individual going into aircraft maintenance training are that he conscientiously apply his skills to each job; that he adhere to prescribed methods, procedures, and techniques; and that he perform his duties with a sense of responsibility to himself, his fellow workers, and his country.

★(2) *Training for entry MOS 67A10.* The individual must meet the prerequisites set forth in DA Pam 350-10. He must also meet the minimum service requirements, in months, as set forth in AR 600-200. To keep the promotion ladder open for men who have the necessary time in grade and experience in various MOS levels, E-6's and above should not be selected to attend the basic entry course. The logical selection is the E-5 or below who has the necessary mental and mechanical ability and a desire to enter the aviation maintenance field.

★(3) *Training in advanced MOS's.* The soldier selected to attend an advanced MOS school must be a qualified Aircraft Maintenance Apprentice (MOS 67A10) through training at an accredited service school or by having demonstrated his ability and knowledge of the MOS as a result of civilian or on-the-job training.

The soldier who has an advanced MOS (e.g., 67N20) and desires to further his training in aviation maintenance is a good prospect for attending other advanced MOS courses, if quotas are available and if the organization needs the particular type training. DA Pam 350-10 lists the prerequisites for qualification. The supervisor must determine if the soldier has enough service time remaining after completion of the course to comply with the regulation. The unit should select only the most deserving and best all-around repairmen for service school training.

★*b. On-the-Job Training (OJT).* *On-the-job training* is training received during the actual performance of duty. It is an integrated portion of the unit training phase. It may be used to qualify an individual for a given MOS when service school training is not possible, or to increase his proficiency in an MOS in which he is already qualified. The trainee must spend a portion of his time in a productive capacity on the job. The best technique is to group experienced, preferably school-trained specialists, with individuals with less training and experience. Thus, the lesser trained repairman learns from an experienced specialist and then applies what he has learned, thereby gaining valuable practical experience. In conducting an OJT program, the following must be considered:

(1) Aviation maintenance training is a continuing necessity and OJT is always required.

(2) Training is the responsibility of the supervisor, the trainee, and the entire unit.

(3) The unit mission is paramount.

(4) A training program must include an instructor and a trainee.

(5) A successful training program must be flexible. It may be necessary to use a combination of training methods, depending on the subject, time available, and the capabilities of the trainee.

c. Methods. The following training methods are basic to a well-planned training program:

★(1) *Direct supervision (apprentice or coach-pupil method).* Coach-pupil instruction is one of the best methods of OJT and is the quickest way to fit a trainee into the operation

of a unit. Without specific direction and guidance in learning to perform duties, a new trainee is likely to waste time and material and form poor work habits. An experienced repairman is able to teach a trainee timesaving shortcuts, the value of using a torque wrench, that safety is everybody's business, that TM's are invaluable guides in performing maintenance, etc.

★(3) *Self-study.* Skilled duties like those in aviation maintenance require considerable job knowledge and judgment. Even simple jobs involve a great deal of basic job information that the repairman must acquire. Training given through direct supervision is seldom complete within itself in developing basic repairmen into skilled, advanced specialists. Formal technical training courses should be utilized to the fullest extent. Repairmen who come to the organization with a fair technical background and some experience can acquire, through study of pertinent technical publications, much of the knowledge needed in the MOS skill for which they are striving.

(3) *Group instruction.* Group instruction is a practical adjunct to direct supervision and self-study. This method is not to be confused with classroom or academic-type instruction. While academic-type instruction will hinder production, group instruction which is intelligently handled can improve production. *For example:* If six trainees are learning the same process and four of them have difficulty with a portion which the other two perform well, the four having trouble can work with the other two and, usually in a short time, resolve the difficulty. Other advantages of this instructional method are that it—

(a) Is a timesaver when several trainees are to be instructed in the same job method or procedure.

(b) Provides opportunity for open discussions and group problem solving.

(c) Develop judgment.

(d) Provides time to motivate the trainees.

(e) Leads to cooperation among the trainees.

(f) Allows the supervisor or trainer to

check progress and to clarify matters which are difficult for the trainee to understand.

d. *Implementation.* When implementing OJT, the supervisor must—

(1) Determine the exact need for training, by establishing the specific job requirements and the individual skills of the trainee. When these two factors are known, this formula may be used: the specific job requirements minus the individual skills of the trainee equals the on-the-job training required.

(2) Determine the method or methods of training which will be most effective. The number of people, time available, facilities required, nature of training, and individual capabilities are factors which will affect this decision.

(3) Select the people who will conduct the training, remembering that the success of the program depends on those who conduct it.

(4) Procure training aids and handouts applicable to the program.

(5) Survey unit assignments to assure that each assignment fits the individual's classification, skills, and background.

(6) Insure that the program is active, that training records are kept current, and that newly developed skills are being used.

e. *Maintenance Training Standards.* Any OJT program for a prospective maintenance crewman or for a specialist studying for a higher and more complex MOS or skill-digit level, must be complete and comprehensive enough to meet the standards of instruction maintained at the service school. These standards can be maintained by coordination with the service school and by the use of master lesson plans prepared for MOS training.

(1) *Coordination with service school responsible for MOS training.* Coordination with the service school can be accomplished by personal visit or by letter stating the purpose of the OJT program and requesting the school's program of instruction, the standards expected of a specialist in the particular MOS, and the process for examining the trainee after instruction.

(2) *Use of master lesson plans.* The master lesson plans available at the service school responsible for the MOS training are excellent

for insuring that the standard of instruction will be on a level with that of the school. Although these master lesson plans are designed for academic presentation, the principles and standards set forth therein will aid the unit in its OJT program. The specialist trained on the job must compare favorably with the school-trained specialist, if unit time and effort are to be worthwhile and if the specialist is to be highly skilled.

f. *Training Suggestions.* In addition to the instructor's information in FM 21-6, the supervisor of OJT can improve the presentation and have a more successful program by—

(1) Teaching the trainee pride in his work. The instructor's attitude is reflected in the trainee's performance. Hence, he should assure that every detail of the trainee's performance is of the highest standard. When practical, the trainee should be sent on flights in the aircraft on which he performed maintenance.

(2) Teaching the trainee what to look for. At first, the trainee may see only the most apparent faults when he inspects an aircraft or an engine. As his training progresses, he will see the missing safety, the broken tube, or the chafed conduit. The instructor should show and explain to the trainee the things to look for when inspecting.

(3) Rotating the trainee. Rotation (cross-training) of the trainee on several phases of the MOS is a bonus to the supervisor who wants a good OJT program.

(4) Giving the trainee definite reading assignments. Assignment of study material in technical manuals and other publications pertinent to the MOS specialty is an important aspect of teaching. The technical manuals on the aircraft associated with the MOS are excellent for helping the trainee learn the basic principles of the MOS.

(5) Giving the trainee practice problems. During OJT the paperwork relative to the MOS specialty should be covered. The trainee is given problems in requisitioning a part and in completing forms and records; these projects help him understand approved working methods by practical exercises and by practice.

(6) Making necessary changes in the program. As TM's, TBAVN's and other publica-

tions change, the references used in the training program must be changed. The local situation, operational problems, and emergencies demand a flexible OJT program.

(7) Measuring the trainee's progress. The trainee should be tested at the beginning of the course. His work papers should be collected, corrected, and saved. After a reasonable length of time the same test questions should again be answered by the trainee, with the results compared. In this way, the trainee's progress can be recorded in a practical manner and his deficiencies noted for further training.

(8) Keeping a checklist of the trainee's progress. A checklist should be kept to record the trainee's progress. It should be flexible enough to conform to the day-to-day operation, yet rigid enough to present a true picture of the trainee's progress. See figure 6-1 for an example of this type checklist.

g. Instructors. The job knowledge of the

OJT instructor must be firm and practical—he must know the practical aspects of the subjects as well as the theoretical. Trainees respect a man who can *do* a job as well as talk about it. An instructor must have the ability to present the material to others; he must also be able to apply common sense to instructional problems. The principles outlined in FM 21-5 for the selection and training of instructors must be followed. Basic points to be considered when selecting instructor personnel are that—

★(1) Instructors be qualified repairmen or technicians and have at least 6 months experience.

★(2) Instructors receive refresher training.

★(3) Instructors receive special training in controlled observation (on-the-spot correction).

★(4) Instructors receive special training in conducting and scoring tests.

		TRAINING ITEMS		DATE	DATE	SUPERVISOR INITIALS
		STARTED	COMPLETED	STARTED	COMPLETED	
PRIMARY MOS 111.0 DUTY MOS 616.0 TRAINING MOS 610.0 TRAINING PROGRESS RECORD NAME MURPHY, B. RANK PFC ASN RA12345678 SECTION ARTILLERY UNIT A	INTRODUCTION TO ARMY AIRCRAFT		1 MAR	1 MAR	WPS	
	BASIC THEORY OF FLIGHT		1 MAR	1 MAR	WPS	
	ARMY AIRCRAFT MAINTENANCE SYSTEM		2 MAR	2 MAR	WPS	
	TECHNICAL PUBLICATION SYSTEM		2 MAR	2 MAR	WPS	
	HANDBOOKS OF INSTRUCTION					
	TIME COMPLIANCE TECHNICAL MANUALS					
	—10 OPERATOR'S MANUAL					
	—20 MAINTENANCE MANUAL					
	—20P REPAIR PARTS AND SPECIAL TOOLS LIST		3 MAR	4 MAR	KWA	
	FUNDAMENTALS OF ELECTRICITY AND AIRCRAFT ELECTRICAL ACCESSORIES					
	WIRING DIAGRAMS, SYMBOLS, ELECTRICAL TROUBLE SHOOTING					
	CIRCUIT CONTROLLING AND PROTECTIVE DEVICES, BASIC WARNING AND FIRE DETECTION CIRCUITS		3 MAR	7 MAR	KWA	
	AIRCRAFT MAGNETOS AND IGNITION SYSTEM					
	ARMY AIRCRAFT HYDRAULIC SYSTEM SERVICE					
	INTRODUCTION TO AIRCRAFT INSTRUMENTS AND AIRCRAFT INSTRUMENT REPLACEMENT					
	PILOT'S MAGNETIC COMPASS					
	FUEL SYSTEM					
	CARBURETION					
	AIRCRAFT CONTROL SYSTEM					
	CARE AND USE OF HAND TOOLS					
	SAFETY:NG					
	DESCRIPTION AND PRINCIPLES OF OPERATION OF ARMY AIRCRAFT PROPELLERS, MAINTENANCE AND HANDLING PROCEDURES					
	PROTECTIVE COATING AND ANTICORROSIVE MEASURES					
	AIRSTRIPOPERATIONS					
	FUEL AND OIL SERVICE					
	AUXILIARY GROUND HANDLING EQUIPMENT					
	GROUND HANDLING					
	AIRCRAFT STRUCTURES					
	RADIO AND TELEPHONE PROCEDURE					
	EQUIPMENT RECORDS					
AIRCRAFT LANDING GEARS						
HELICOPTER POWER TRAINS						
SAFETY PRECAUTIONS AND CRASH RESCUE						
RECIPROCATING ENGINE PRINCIPLES AND ENGINE COMPONENTS						
INTRODUCTION TO ENGINE CONDITIONING AND ENGINE TROUBLE SHOOTING						
EQUIPMENT LOG BOOK FOR ARMY AIRCRAFT						
INTRODUCTION TO MAINTENANCE FORMS						
MAINTENANCE REQUEST						

avvt 318

Figure 6-1. Sample checklist for recording a trainee's progress.



1

2



3

4



CHAPTER 7

PUBLICATIONS AND CHARTS

Section I. PUBLICATIONS

7-1. General

The organizational maintenance unit is responsible for obtaining and filing those publications which pertain to the administration and operation of the unit and its assigned equipment. Publications required to insure the safe operation and efficient maintenance of unit aircraft must be available and be kept current. Individuals assigned to the unit must be familiar with the publications system and must know how to use the appropriate publications in performing organization maintenance. They should be encouraged to rely on the information contained in the publications and to have the appropriate publications available at all times when working on aircraft. Army Regulations 310-1 and 310-3 cover military publications' general policies, preparation, coordination, and approval. They also contain a detailed explanation of the publications numbering system.

7-2. Publications Files

a. Procurement. Publications files will be accessible to all personnel. The two methods for obtaining publications for unit files are *pinpoint distribution* and *formula distribution*. DA Pamphlet 310-10 provides a comprehensive guide for acquiring adequate publications.

(1) *Pinpoint distribution.* Pinpoint distribution is a method of initial distribution and resupply of selected publications directly to Active Army and USAR units from a single Adjutant General Publications Center (AR 310-1). Requirements are submitted on the appropriate DA Form 12-series through channels to the appropriate center. DA Forms 12-4 and 12-9 are used by aviation maintenance units for pinpoint distribution of administrative publications. DA Forms 12-31 and 12-34 cover

the majority of technical publications required for aircraft maintenance. The unit determines which publications are required to accomplish its mission and fills out the applicable DA Form 12. This form is sent to the battalion or next higher headquarters for approval and for mailing to the U.S. Army Publications Centers (Baltimore or St. Louis) for direct distribution to the unit. Each unit which has an account with a U.S. Army Publications Center will be assigned an account number which must appear on all forms. When publications requirements change, a revised DA Form 12 must be sent through channels to the appropriate center. Certain publications, such as AR's and circulars, will be sent to battalion or group and will be broken down for issue to the assigned units. In this case, the unit requirements are sent to the battalion on a DA Form 12 where they are consolidated.

(2) *Formula distribution.* Formula distribution is a list of specific using organizations with an allowance for each (AR 310-1). The formula distribution in formation listed on the publication determines who will receive it. Requirements for publications receiving a formula-type distribution are computed on DA Forms 12-1, -2, and -3. Additional copies of publications, replacement publications, or those which are not included on automatic distribution may be requisitioned on a DA Form 17. This form is for a one-time issue and will not change the number or types of publications which will be received on pinpoint distribution.

b. Indexes. Military publications indexes are contained in DA Pam 310-series and list all Department of the Army publications. Publications are listed in the indexes in the order shown on the front of the publication, in nu-

merical order. An alphabetical listing by subject or item of equipment is in the back of each index. Individuals must understand the index system and the use of the indexes in order to identify and locate publications. To find a particular publication, an individual should look up the subject in the back of the index and find the number of the publication containing information on the subject. He may then turn to the numerical listing and obtain the detailed information on the publication (title, date, number of changes, etc.). The indexes of primary interest to the organizational maintenance unit are—

(1) DA Pam 310-1, Military Publications: Index of Administrative Publications.

(2) DA Pam 310-2, Military Publications: Index of Blank Forms.

(3) DA Pam 310-3, Military Publications: Index of Doctrinal, Training, and Organizational Publications.

★(4) DA Pam 310-4, Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.

(5) DA Pam 310-6, Military Publications: Index of Supply Catalogs and Supply Manuals (excluding types 7, 8, and 9).

★(6) DA Pam 310-7, Military Publications: U.S. Army Equipment Index of Modification Work Orders.

c. Currency of Files. Files will be checked against appropriate indexes to insure that they are up to date. After a file is initially established, its current status will be checked against each applicable new numerical index, revision, or supplement received. Each active file will be checked annually against the appropriate numerical index to determine any deficiencies or excesses in the file.

d. Inspection of Files. Publication files will be inspected to insure that—

(1) All publications required by using personnel are available.

(2) Files are conveniently located to users.

(3) Unnecessary publications are not in the file.

e. Appendixes. An appendix is an addition to a publication and may include tables, charts,

and supplementary information. It is an integral part of the publication, though not a part of the normal sequence of discussion. An appendix may be a part of the basic publication (e.g., an appendix of flight operating charts in a flight manual), or it may be issued separately to include additional information in an existing publication. Each separate appendix received will be filed at the end of the basic publication, which will be posted to show the addition.

f. Changes. Department of the Army publications are maintained in current status by the publication of numbered changes or revisions. The first change issued in numbered C 1, the second C 2, etc., and later changes may supersede previous ones. As these changes become available, they are listed by change number, under the basic publication number and title, in the appropriate numerical index.

g. Technical Manuals for Aircraft Files. Each Department of the Army aircraft must have its individual publications file. AR 750-31 lists those technical publications and forms which must be included in each file and contains instructions for their location and maintenance. Aircraft files will consist of those publications specified in AR 750-31 and by current directives, plus others included by the maintenance officer, which are necessary for mission accomplishment. The maintenance officer must insure that maintenance personnel are aware of the location of the individual items included in the aircraft files and that they have access to them when required.

h. Disposition of Publications. Publications may be disposed of when they have been rescinded, replaced, superseded, or when they are no longer needed.

(1) Unclassified publications will be disposed of as directed by the local salvage officer.

(2) Classified publications will be destroyed in accordance with AR 380-5.

7-3. Technical Publications

Technical information on Army aircraft operation, maintenance, and supply is found in technical manuals, technical bulletins, modification work orders, supply manuals, and supply bulletins. These publications provide specific information on tools and repair parts allowances,

operation, and maintenance and supply procedures for all aircraft.

a. Technical Manuals (TM).

(1) *Definition.* Technical manuals are divided into two groups (AR 310-1).

(a) *Equipment manuals.* These manuals cover preparation for use, operation, maintenance, and overhaul instructions. In addition, they contain parts lists and related technical information.

(b) *Other manuals.* These manuals are prepared on a variety of subjects, other than equipment, which are considered necessary for training.

(2) *Numbering.* Equipment manuals will be numbered as follows:

(a) The designated number of the preparing technical service.

(b) A dash and four digits representing the Federal Supply Classification or class (SB 708-21) assigned to the equipment.

(c) A dash and three digits beginning with 200. All parts of a technical manual on the same item of equipment will have the same number. Successive manuals in the same FSC group or class will be numbered 201, 202, etc.

(d) A dash and two digits indicating the category of maintenance to which the manual applies.

1. Operator's Instructions-10.
2. Organizational Maintenance Instructions-20.
3. Direct Support Maintenance Instructions-30.
4. General Support Maintenance Instructions-40.
5. Combination of categories. Support and depot combined would be numbered-35.
6. Depot Maintenance Instructions-50.

(e) A serial number of (/1, /2 etc.) when a manual part or part combination is published in more than one manual.

(f) The suffix letter P for repair parts manuals.

(g) Manuals which prescribe equipment serviceability requirements will have -ESC immediately following the three digit item identification.

(h) Preventive maintenance inspection

checklist (daily, intermediate, periodic) will have either -20PMD, -20PMI, or -20PMP following the item identification.

Note. Other manuals are assigned a basic number indicating the subject matter to which the manual applies and a subnumber for further identification within its particular class.

★*b. Technical Bulletins (TB).* Technical bulletins contain only technical information. They do not contain administrative material or material pertaining to tactical training or tactical operations. They may supplement TM's but will not make direct changes in the content of the manuals or be published in lieu of TM's.

c. Modification Work Orders (MWO). Modification work orders contain instructions for the alteration and modification of materiel. They require compliance within specified time limits and are grouped according to the importance and urgency of the instructions they contain. They furnish supplementary instructions and operating procedures and are the only authorized media to provide modification instructions for aircraft and equipment. Commanders will insure that operating personnel become familiar with the contents of these publications. The two types of MWO's are *Urgent Action*, and, *Normal Action* (AR 750-5).

(1) *Urgent Action.*

(a) Urgent Action MWO's are issued to correct dangerous or potentially hazardous conditions which could result in injury to personnel, damage to property, or unacceptable reduction in combat efficiency. Such risks are calculated to be tolerable only within definite time limits as specified in (b) below.

(b) These MWO's either ground the aircraft immediately or specify that the work is to be completed within dates specified on the MWO, usually not to exceed 10 days after receipt of the MWO. The first page is marked with a distinctive border with URGENT ACTION printed at the top of the page.

(c) Appropriate form entries will be made in accordance with TM 38-750.

(d) If compliance is not accomplished within the time limit specified, the aircraft condition status symbol will be changed as directed on the first page of the MWO.

(2) *Normal Action.*

(a) Normal Action MWO's are issued when procedural faults are found which would prove hazardous through prolonged, continuous use. These faults may be of a material, mechanical, operational, or tactical type; they involve risks which are considered tolerable within broad limits. In addition to being hazardous, faults of this type may reduce—

1. Operational efficiency.
2. Operational life or general service utilization.
3. Tactical or tactical support usefulness.

(b) Normal Action MWO's are printed on plain white paper without border symbols and are issued without recision dates. Each MWO will state who will accomplish the work, when it will be accomplished, instructions to be followed in the event it is not accomplished, by the specified time, the form entries required, the stocks affected, and the aircraft affected.

d. *Supply Catalogs and Manuals (SM).* Supply manuals contain item identification and operational information required by supply and related activities. They include the following: Federal stock numbers, Federal item names and description, units of issue, expendability, parts allowances and stockage data, cross references, and other essential supply information. Current listing of supply catalogs and supply manuals is found in DA Pam 310-6.

e. *Supply Bulletins (SB).* Supply bulletins contain information on the more technical aspects of supply matters, such as compiled logistical data, etc. They do not contain administrative supply instructions. Information pertaining to aviation supply may be found in the SB-1 or SB 55-series bulletins.

7-4. Supplementary Type Publications

a. *Safety of Flight Supplements.*

(1) *General.* Safety of flight supplements are issued to give prompt safety of flight information. They contain important informational, operational, precautionary, and restrictive instructions that affect safety of flight but do not require grounding of the aircraft. When safety of flight information is applicable to more than one type of aircraft, separate supplements are issued for each type of aircraft involved.

(2) *Types.* These supplements are issued in two forms—*interim* and *formal*.

(a) *Interim supplements.* Interim supplements are issued by teletype message when loss of life or serious injury to personnel may be involved.

(b) *Formal supplements.* Formal supplements are printed and distributed through normal channels when serious damage to the aircraft is involved, or to replace interim supplements.

- (3) *Description.* Safety of flight supplements are designed to be readily identified by aviators and other flight crew members. The first page of formal supplements has a complete border of red FS's with these words in red: SAFETY OF FLIGHT SUPPLEMENT FLIGHT HANDBOOK at the top of the page, and SAFETY OF FLIGHT at the bottom of the page. Both the interim and the formal supplement bear this directive. "Commanders are responsible for bringing this supplement to the attention of all personnel cleared for operation of subject aircraft."

(4) *Filing.*

- (a) Supplements are filed in numerical and/or alphabetical order immediately following the basic publication.

- (b) They remain active until rescinded or included in the basic publication by revision or reissue.
- (c) They are maintained in all files where the basic publication are required, including aircraft files, aircraft emergency operating instruction files in control towers, operations office files, and flight crew information files.

b. Commercial Technical Publications. Commercial technical publications are normally furnished by manufacturers to purchasers and contain technical information on assembly, installation, operation, servicing, overhaul, and parts identification of specified equipment. Commercial publications are not to be used when a comparable military publication is available.

Section II. CHARTS

7-5. General

Charts may be used at the discretion of the aircraft maintenance officer. Since they are not approved charts for this purpose, they must be locally produced and should be constructed to meet the needs of the individual unit. A unit is not required to use charts and should only maintain those considered necessary for the efficient conduct of the unit's mission. If they are used, each chart should be designed for a specific purpose. Charts should be easy to read, easy to keep current, and small enough to be moved if the maintenance office is displaced. Charts must be kept current at all times in order to achieve their purpose. When properly maintained, they provide up-to-date, consolidated maintenance information to the maintenance personnel at all times. Charts contained in this manual are reproductions of some which have been used by organizational units.

7-6. Aircraft Status Chart

a. An aircraft status chart (fig. 7-1) may be used to provide consolidated maintenance information on all aircraft. This chart should be covered with acetate so that frequent

changes may be made in order to keep aircraft status and other information current.

b. Individual crew chiefs and mechanics are responsible for keeping information concerning their particular aircraft current. However, the maintenance supervisor must monitor the chart to insure that it is properly posted. The hours columns should be posted daily, while the aircraft status and remarks must be changed as often as the aircraft status changes. The status, aircraft hours, and the periodic and intermediate inspection hours are taken directly from the DA Form 2408-13 for each aircraft. A chart similar to this is used in most organizational maintenance units and has proven to be one of the most useful types.

7-7. Commander's Daily Aircraft Status Report

A commander's daily aircraft status report (fig. 7-2) can be used to provide information to unit commanders, aviation officers, or operations officers. This report normally contains a list of all aircraft assigned to the unit and provides information on aircraft status, hours till the next intermediate and periodic inspection, the reason and date grounded, and other

Figure 7-1. Aircraft status chart.

DISPOSITION FORM						SECURITY CLASSIFICATION (IF ANY)			
FILE NO.			SUBJECT COMMANDER'S DAILY AIRCRAFT STATUS REPORT						
TO			FROM				DATE/TIME		
LINE E	TYPE ACFT A	ACFT SER. NO. B	ACFT STATUS C	HRS. TO PMI INSP. D	HRS. TO PMP INSP. E	GROUNDED DATE & LOCATION F G		EXPECT RELEASE DATE H	REMARKS I
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Figure 7-2. Commanders' daily aircraft status report.

pertinent remarks. It may be written on a piece of plain paper or may be stenciled on a standard disposition form (fig. 7-2). The aircraft type and serial number may be included on the stencil. This report is valuable in the coordination between the maintenance officer and the operations officer. By using this form, the operations officer can schedule the aircraft to allow for equal distribution of flying hours and aid the maintenance officer in scheduling the maintenance so that the minimum number of aircraft will be down for maintenance at any one time. This form should be prepared daily and sent to the operations officer before he schedules the aircraft for the following day's flights.

7-8. Deleted.

7-9. Modification Work Order and Technical Bulletin Compliance Record

a. A consolidated MWO/TB compliance record, showing those MWO's/TB's which have not been fully complied with, may be maintained in the maintenance office of all maintenance units. This record may be kept on charts, Kardex files, cards, or any other form from which commanders can readily determine the status of each assigned aircraft for MWO/TB noncompliance.

b. The consolidated record will contain the following information:

- (1) Type, model, and serial number of all assigned aircraft.
- (2) All applicable MWO's/TB's not fully complied with.

(3) Status of compliance for those MWO's/TB's not complied with, including the number, date of issue, expiration date, and request number of the MWO/TB kit.

7-10. Aircraft Maintenance Status Log

a. An aircraft maintenance status log (fig. 7-4) may be maintained for reference and to expedite the preparation of DA Forms 1352, 2406, and 2408-3. This chart may be made on 8- by 13-inch typing paper, with a new sheet for each month; or, a more permanent acetate-covered chart may be hung on the wall and used month after month.

b. Daily entries will show the exact status of the aircraft at the *beginning* of the operational day. Entries will be indicated by coloring the appropriate blocks in accordance with the code shown in figure 7-4.

c. The number of hours that an aircraft is on a red X condition each day will be entered in the daily block in the appropriate color (24 hours available per day).

d. If the aircraft status changes during the day from or to EDP, field maintenance, or modification, this change will be shown on the chart the following day.

e. An aircraft for which accountability is lost will be indicated by an L in the status block for the day accountability was terminated. This L will be followed by the number of hours (to the nearest full hour) the aircraft was flown during that portion of the month.

C 2, FM 1-10

Figure 7-3. Accessory replacement and retirement schedule.

[illegible]

Figure 7-4. Aircraft maintenance status log.

This entry depicts a "Review" period during which no demands were recorded. Review date shown in date column.

DA FORM 3318
1 MAR 68

RECORD OF DEMANDS - TITLE INSERT
(AR 735-36)

REPLACES DA FORM 1845, 1 MAY 62 AND DA FORM 2527, 1 MAR 62, WHICH ARE OBSOLETE.

RECORD OF DEMANDS

STOCK NUMBER **2940-678-4695**

ORGANIZATION DOCUMENT NUMBER	QUANTITY DEMANDED	CUMULATIVE QUANTITY DEMANDED	BALANCE ON HAND	ORGANIZATION DOCUMENT NUMBER	QUANTITY DEMANDED	CUMULATIVE QUANTITY DEMANDED	BALANCE ON HAND	ORGANIZATION DOCUMENT NUMBER	QUANTITY DEMANDED	CUMULATIVE QUANTITY DEMANDED	BALANCE ON HAND
5006-	0	0	4	5104-004	⑥	13	0				
5007-001	⑥	6	0	5109-003	⑥	19	5				
5008-008	②	8	0	5116-001	⑤	24	0				
5009-003	③	11	1	5120-001	⑥	30	5				
5018-004	①	12	0	5126-004	⑦	37	0				
5021-002	③	15	4	5130-001	⑨	46	5				
5028-011	④	19	0	5133-004	⑧	54	0				
5033-013	⑤	24	4	5136-009	⑥	60	5				
5040-002	②	26	2	5140-002	⑤	65	0				
5049-004	④	30	4	5146-001	⑤	70	5				
5054-009	6	36	0	5160-022	④	74	1				
5059-003	⑦	37	0	5165-004	②	76	0				
5062-002	⑦	44	4	5175-001	⑥	82	5				
5070-003	⑤	49	0	5180-002	⑦	89	0				
5073-INV	-	49	4	5188-006	⑤	94	5				
5081-010	①	50	3	5190-002	⑧	8	0				
5082-013	2	52	3	5192-004	8	16	5				
5091-004	⑤	55	0								
5092-009	⑥	61	4								
5097-004	①	62	3								
5099-009	②	⑦	5								

DETACHED FROM 3318, 1 Mar 68

TITLE INSERT

REMARKS
Tank M-60 off ea.
TM 9-2300-223-20 P

STOCKAGE CODE
MS

DATE
4182

QTY
4

AUTHORIZED STOCK LEVEL (use pencil)
H963

LOCATION
4

58

Date of periodic inventory

Stockage code (ref para 6-4d) (i) (f) date and initial stockage quantity.

Figure 7-5. DA Form 3318, Record of Demands—Title Insert.



1

2

3



4

5

6



7

CHAPTER 8

AVIATION TECHNICAL SUPPLY

Section I. GENERAL

8-1. General

★The unit technical supply is the activity from which the organizational repairman receives the necessary repair parts and tools with which to maintain his aircraft. He also turns in to this activity the old or wornout parts which have been removed from his aircraft. Technical supply is the using end of the parts supply system. It links the organization to the other end of the long supply chain; i.e., the depot repair activity. To establish efficient, economical technical supply for Army aircraft, normal supply procedures may vary because of the location of aircraft in relation to the parent organization or because of the problems peculiar to aircraft operations. General supply procedures are contained in AR 735-35.

8-2. Authority and Scope of Operation

The unit technical supply officer (additional duty) is responsible for the establishment and operation of the unit technical supply. He must insure that the procedures outlined in applicable Department of the Army supply publications are followed. Technical supply is separate from unit supply but is subject to the same inspections and supervision. All technical service items and tools necessary for aircraft operation, not including those items which come under unit supply, will be controlled by the unit technical supply officer. Specific functions of the technical supply include—

a. Maintaining the prescribed load of spare parts based on the -20P for each assigned aircraft. The complete prescribed load will be on hand or on order at all times.

b. Requesting, storing, issuing, and turning in of all spare parts and tools required by the unit to maintain their assigned aircraft.

c. Maintaining the unit tool room for the storage, maintenance, and issue of the organizational maintenance tool sets and aircraft special tools.

★d. Assignment and periodic inventory of the general repairman's tool sets. These sets will be signed out to individual repairmen on a hand receipt which will be filed in the technical supply room.

8-3. Classification and Definition of Air Items

★Air items include manned and drone aircraft, trainer and flight simulators, and supplies and equipment used in support thereof which are received, stored, and issued by the Department of the Army. The name of a commodity command preceding the expression "air item" will indicate the supplier responsible for the item; e.g., air items, etc. Classification and definition of air items (AR 710-50) include:

a. *Principal Air Items.* Items which, because of their major importance, require detailed analysis and examination of all factors affecting their supply and demand. Their selection is based upon such criteria as strategic importance, high monetary value, unusual complexity of issue, and procurement difficulties.

b. *Secondary Items.* Any items, including end items, components, and spare parts, which have not been classified as principal items.

★c. *Regulated Items.* Items, including end items and secondary items, as listed in SB 725-28 over which Army Materiel Command or delegated authority (U.S. Army Aviation Materiel Command) must exercise close supervision of issues or individual requisitions to insure distribution to proper units and commands in accordance with Department of the Army priorities because the items are scarce,

costly, or of a high technical or hazardous nature.

d. Nonregulated Items. All items other than regulated items.

e. Rapid Service Items. Stock type secondary items of supply designated for expedited supply action.

f. Critical Items. Essential items which are in short supply or expected to be in short supply for an extended period.

g. Recoverable Items. Items considered by the cognizant commodity command to be worth being repaired and used again.

h. Nonrecoverable Items. Items not considered by the cognizant commodity command to be worth being repaired and used again.

i. Serviceable Items. Items which are in condition for use.

j. Unserviceable Items. Items which are not in condition for use.

k. Automatic Return Items. Secondary items selected by the cognizant commodity command for return to the initial source of supply without recourse to individual line item disposition reporting prior to shipment.

8-4. Federal Supply Classification

The Federal supply classification (FSC) has been developed and adopted by the Office of the Secretary of Defense for use in classifying items of supply identified under the Federal cataloging program. The FSC is designed to permit the classification of all items in the supply system. In order to accomplish this, groups and classes have been established for all items. To identify these groups and classes, the FSC uses a four digit coding structure. The first two digits identify the group, and the last two digits identify the classes within each group. The primary use of the FSC code number is in the Federal stock number (FSN). The FSN for an item consists of the applicable four-digit FSC code number plus the seven-digit Federal item identification number. The Federal supply classification is covered in three indexes as follows:

a. Part 1. Groups and Classes (Cataloging Handbook H2-1). This handbook shows all groups and classes, listed numerically by the four-digit FSC code numbering system.

b. Part 2. Numeric Index of Classes (Cataloging Handbook H2-2). This publication presents the names of items included within each class, listed alphabetically under the class number and title.

c. Part 3. Alphabetic Index (Cataloging Handbook H2-3). This handbook is an index of all names of items which appear in Part 2, arranged in alphabetical order.

8-5. Army Field Stock Control System (AFSCS)

a. General. The Army Field Stock Control System (AFSCS) facilitates the economic distribution of secondary items, with particular emphasis on repair parts. Its objective is to insure that an adequate amount of supplies is in the proper place at the proper time without overstocking at any point of supply. This objective is attained through use of the AFSCS as a tool of operation and management (AR 711-16). This system provides for—

(1) Establishment of a realistic stockage plan (item and quantitative) at all echelons of supply, based upon demand data of the activities supported. Stocks are maintained in direct relation to consumer requirements.

(2) Establishment of a uniform method of supply accounting among all commodity commands at the forward supply echelon.

(3) Establishment of realistic replacement factors for computing requirements, using demand data experience.

(4) Establishment of realistic organization allowances, based upon demand data experience.

(5) Establishment of improved parts list, based upon demand data experience.

(6) Establishment of a method whereby the effectiveness of the supply and maintenance activity may be determined.

(7) Reduction of the number of items and quantities of items at forward supply echelons.

(8) Reduction of storage and accounting costs at forward supply echelons by the reduction of items stocked.

b. Consumption Demand Data. The most important element to which any supply system is geared is the rate at which any item is demanded for consumption. This rate is the basis

for computing requirements and for effecting sound procurement. Provisions have been made in the Army Field Stock Control System for the recording of true consumption demand data at the installation level of supply and the reporting of this data to U.S. Army Aviation Materiel Command. Prior to the inception of AFSCS, requirements computed at all echelons were based on "issue experience" rather than "demand experience." The use of "issue experience" results in stockage of the items which were actually issued rather than the items which were demanded. For example, if a substitute item is issued due to lack of stock for the item demanded, accumulation of "issue experience" results in the increased stockage at all levels of supply for the substitute item and no stockage for the item demanded. Accumulation "demand experience" results in the stockage requested.

c. Unit Requesting.

(1) The AFSCS establishes a system whereby using units may request daily, the authorized supplies as required, when supported by a properly executed request document.

★(2) The request flows through the supply channel, without consolidation, to the first commodity command stockage point, where supply action is taken without delay. The fact that consolidation of requests is eliminated does not lessen the responsibility of supply officers for maintaining a well-managed supply system (AR 711-16).

8-6. Military Standard Requesting and Issue Procedures (MILSTRIP) and Military Issue Priority System

★This system as defined in AR 725-50 requires that the fastest mode of transportation and routing will be used as necessary to meet requirements of operating forces for high priority materiel demands. The objective is to satisfy the customer's materiel demand on time without operating and transportation costs becoming an overriding factor. Effective operation of this system depends on the proper use of urgency of need designators and issue priority designators (app II, AR 711-16; and AR 735-35-1).

8-7. Deleted.

Section II. REPAIR PARTS PROCEDURES

8-8. Prescribed Load List (PLL)

★The PLL is a mechanical printout prepared by or provided for an organization. It lists the repair parts that are required to be on hand or on order for the performance of organizational maintenance. PLL shows the quantity of combat essential supplies and repair parts (other than ammunition) authorized to be on hand in units to enable the unit to sustain itself until resupply can be effected (normally 15 days level). A copy of the PLL of the organization will be provided the support maintenance and supply unit. The PLL will be computed and repair parts will be stocked at the lowest level at which organizational maintenance is performed requiring repair parts, based on the -20P for each item of equipment and AR 735-35.

★8-9. DA Form 2765-Series

These forms have been designed to initiate a

request or turn-in of a single line item. (They replace DA Form 1546.) A detailed description of their preparation and use is contained in AR 711-16.

a. DA Form 2765, Request for Issue or Turn-In (Mechanical). This form is an 80-column single part card designed so that certain common supply management data can be pre-punched and preprinted thereon. These cards are provided each unit for each item on the PLL and other expendable items that are requested on a recurring basis. This form is used only for expendable items and repair parts.

b. DA Form 2765-1, Request for Issue and Turn-In (Manual). This is a three-part carbon interleaved form which is basically the same as DA Form 2765. It is used to request non-expendable items. The first (hard) copy is retained by the supplying activity as a voucher file. The middle (tissue) copy is returned to the requesting organization for dueouts. The third

(hard) copy will be returned by the supplier with the requested item.

8-10. Repair Parts Records

★*a. General.* Upon approval of the commander for whom the property book is maintained, repair parts records may be established and maintained at the organizational maintenance activity. In such instances, a separate document register (DA Form 2064) and a separate series of document numbers will be established. Units will establish and maintain separate document registers for expendable and nonexpendable property. Separate blocks of serial numbers may be reserved for assignment to expendable and nonexpendable items. Instructions for completing the document register are contained in AR's 711-16 and 735-35.

★*b. Visible File.* A visible file or folder will be used by each unit, organization, or activity authorized to stock repair parts. Repair parts records to be maintained in the visible files are as follows:

(1) DA Form 3318, Record of Demand—Title Insert (fig. 7-5) which is a two section form and is perforated to facilitate separation. When the record of demand section is filled, the form may be separated and turned over for additional postings. Record of Demand—Title Insert will be prepared for each line item authorized for stockage and placed in a visible file cabinet or folder in stock number or alphabetical sequence.

(2) In order to readily determine the status of line items in the repair parts visible file records, signals consisting of colored tabs may be used to reflect information, e.g., zero balance.

(3) Entries on the Record of Demand—Title Insert will be as follows:

(a) *Title Insert.* Entries on the Title Insert are as follows:

1. Stock number.
2. Short line description.
3. Location of item.
4. Authorized stock level (enter in pencil).
5. The remarks block of the title insert will include as a minimum—
 - (a) End item application.

(b) Interchangeability data.

(c) Unit of Issue.

(d) The reference number(s) of the appropriate technical manuals used to compute the quantity entered as the authorized stock level.

6. Stockage codes will be entered to indicate the criteria to be considered in computing authorized stockage levels, the date the item was incorporated into the PLL, and the stockage quantity at this time. The stockage codes are as follows:

(a) DS (Demand Supported) will be used to indicate "as required" items which have qualified for stockage based on demands.

(b) MS (Minimum Stockage) will be used to indicate the other than "as required" items indicated in the technical manuals.

(c) HD (High Dollar) will be used to indicate high dollar value items (\$200 and over) and recoverable item coded "T" in the technical manuals.

(b) *Record of Demands.*

1. The Record of Demands section is designed to record quantities of repair parts requested, regardless of the source. This specifically includes items obtained from another unit or from salvaged equipment during emergency situations. The primary purpose of this Record of Demands is to enable the organization to adjust authorized quantities or repair parts based upon actual demand experience. Explanation of entries to be placed on the Record of Demands is as follows:

(a) The stock number indicated on the Title Insert will be placed in the upper right corner of the form.

(b) The organization document number assigned to the request will be entered in column *a*. The date and the term DX, SSSC, or SALTI as applicable will be entered for items obtained from these sources.

(c) The quantity requested or exchanged will be entered in column *b*. This entry will be circled when a partial or total quantity has been received. Quantities remaining due in after partial receipt will be entered in pencil beside the initial quantity demanded entry. After final receipt, the pencil entries will be erased.

(d) Column *c* will reflect the cumulative total quantity demanded since the last quarterly review.

(e) Entry in column *d* will be in pencil. The balance will be carried forward with each posting or a demand. Inventories will be taken semiannually, or more often as directed by the organization commander. When these inventories have been completed, the Julian date and the abbreviation "inv" will be entered in column *a*. Column *c* will be posted to reflect current accumulated quantity demanded. Column *d* will be posted with the quantity determined by the inventory. Inventories are informal; therefore, count slips are not required.

2. Action required to correct cancellation entries on Record of Demands depends upon the number of transactions entered on the form since the entry to be canceled was made. If none, line through entry, overprint "canceled," and proceed with next entry. If one or more entries have occurred, line through canceled entry. Overprint "canceled," erase and correct pencil entries in column *c*, line through and correct entries in column *d*. Care should be taken that canceled postings occurring in one review period are not carried over into the next review period.

(4) Upon receipt of information that a stock number has been changed, all records and appropriate equipment publications will be posted to reflect current stock number.

c. Due-In Suspense File (AR 735-35). The due-in suspense file is an up-to-date record of the current status of items requested for which there is a delayed supply action. This file will permit ready followup to obtain status of items due-in. The unit will maintain a temporary due-in suspense file and a regular due-in suspense file.

★(1) DA Forms 2765 returned to units containing due-in information will be filed in a temporary due-in suspense file. Upon receipt of the items, the appropriate card will be removed from the file; after the required entries are made on the supply records, it will be destroyed.

(2) When DA Forms 2765 are received by the unit indicating that items have been placed

on request by the supporting supply activity, they will be filed in the regular due-in suspense file. Copies previously filed in the temporary file will be destroyed.

(3) Upon receipt of a supply status card or a shipment status card, this card will be filed in the due-in suspense file in front of all other cards pertaining to the same item.

★(4) Followup action may be initiated to determine the status of a request. Such action should not be taken prior to the expected delivery date contained in block 20 of the returned DA Form 2765 or the expected receipt date on the latest status card. Instructions for followup are contained in AR 735-35.

★(5) Items which are no longer needed should be canceled. Procedures for cancellation of requests are contained in AR's 725-50 and 735-35.

8-11. Repair Parts Stockage

★*a.* Major CONUS and oversea commanders will determine the number of PLL's the units within their command will carry. Those units required to have boxed or packaged PLL's on hand because of special mission assignment will compute those quantities separately from the quantities required for operating stocks at their permanent station. Boxed or packaged PLL's will be inspected at least quarterly to insure that—

(1) Obsolete items are removed.

(2) Adjustments are made to quantities and stock numbers are corrected, based upon changes in pertinent DA publications.

(3) No apparent damage has occurred since previous inspection.

(4) Items with "shelf-life" dates will be rotated or replaced as required.

b. Repair parts listed in the applicable technical manual for issue only as required may be stocked by a unit provided three or more demands for a particular part have occurred within six review periods (180 days) (AR 735-35).

★(1) A separate DA Form 3318 (Record of Demands—Title insert) will be prepared when the first request is submitted for any part not on the unit's PLL.

(2) These forms will be filed in a separate card deck by Federal stock number sequence. Only one card is required for each line item.

(3) The Record of Demands file will be reviewed each time a posting is made to determine those items which have accrued three or more demands within 180 days, to qualify the item for addition to the organization's PLL.

(4) Items qualifying for stockage may be added to the PLL after approval of the organization commander and after the supporting supply activity has been informed of the change.

(5) A quarterly review of the Record of Demands file will be made for the purpose of removing and destroying cards which are no longer applicable to equipment on hand or have no demands during the previous 180 days.

8-12. Revision of Quantities of Repair Parts Authorized for Operational Stocks

The following procedures will be used:

★*a.* Record of Demands—Title Insert cards will be reviewed monthly and a line drawn below the last entry reviewed.

b. For those Record of Demands cards that indicate three or more demands for the most recent six review periods (180 days) the quantity authorized for stockage will be computed based on the days of supply authorized.

★*c.* The quantity resulting from the above computation will be entered on the Title Insert portion.

d. The quantity on hand and due-in will be adjusted to the recomputed stock level.

★*e.* The Record of Demands—Title Insert card for those items turned in as excess will be retained. Further demands will be on an "as required" basis and will be posted to the Record of Demands card the same as for other nonstocked items.

8-13. Forecasting and Submission of Abnormal Requirements

To assure that equipment is in a constant state of material readiness, units will determine and submit forecasts of abnormal requirements for authorized repair parts to their supporting supply activity far enough in advance to assure their availability when needed. This may be accomplished by—

a. Analyzing maintenance management data from the Army Equipment Records maintained in accordance with TM 38-750 and other data made available to the unit in accordance with TM 38-750-1.

b. Determining (from the above analysis and a projection of planned operations) whether there will be an abnormal quantity of authorized repair parts required because of known wear factors, seasonal requirements, and time change considerations.

c. Providing the supporting supply activity with forecast quantities and dates that required parts will be needed; also, notifying support maintenance units if assistance will be needed and the amount needed to accomplish the installation of the abnormal quantity of parts.

Section III. STORAGE AND ISSUE TURN-IN PROCEDURES

8-14. General

Detailed procedures for the storage and issue turn-in of repair parts and tools will normally be contained in the unit maintenance and supply SOP. Every individual within the unit is responsible for studying this SOP and becoming thoroughly familiar with the information it contains. Procedures for the storage and issue of items may vary from one unit to another, but each unit must have a definite plan which will best serve its particular needs.

8-15. Storage

Items stored in the unit technical supply and tool room include—

★*a.* *Parts Ordered For Individual Aircraft.* Parts ordered for a particular aircraft should be stored in a separate bin for the aircraft. These bins should be clearly marked with the aircraft number. Crew chiefs should make periodic checks to determine what parts have been received for their aircraft. When the air-

craft is grounded for a major inspection, all parts which are in the bin should be installed.

★*b. The Prescribed Load List (PLL) of Repair Parts.* The PLL will be kept on hand or on order at all times. These parts will be stored in cabinets, shelves, bins, or other containers as directed by the technical supply officer. The location of each part contained in the PLL will be indicated on its DA Form 3318, Record of Demands—Title Insert. Specific instructions for the storage of items are contained in AR 700-15 and AR 740-12. The technical supply clerk will insure that items are stored in the proper place in accordance with the applicable directives.

★*c. Turned-In Parts.* Turned-in parts will be stored in a separate bin until they are forwarded to the supply support activity. Technical supply clerks must insure that these parts have been inspected and properly tagged prior to being turned in by the crew chief. Tagging of materiel with materiel condition tags will be in accordance with TB 750-126.

d. Tools. Tools stored in the toolroom may be aircraft special tools, organizational maintenance tool sets, or general repairman's sets. The special tools and organizational maintenance tool sets will normally be kept in the toolroom and signed out to individuals as needed. The toolroom clerk must insure that tools are returned after being cleaned and serviced by the using crew chief or repairman.

8-16. Issue and Turn-in

a. Repair Parts. Repairmen and crew chiefs should use DA Form 9-79, or a similar locally produced form to request parts from the unit technical supply. These forms should be made up in at least two copies. The technical supply clerk will use one copy as a work copy and will return one copy to the repairman or crew chief as a receipt. The receipt copy should be kept by the individual until the part is received and then it will be destroyed. Normally, upon receipt of a request for a part the supply clerk will issue the part from the PLL and order a replacement part for stock. If the part is not in stock, it will be ordered and the crew chief will keep his copy of the DA Form 9-79 as a dueout. Crew chiefs who turn in parts to the

technical supply will first have the parts inspected and marked either serviceable or unserviceable by the unit technical inspector. Parts will be cleaned, preserved (if required), and properly tagged prior to being turned in. Equipment improvement recommendations will be prepared on DA Form 2407 for those parts which fail before the expected retirement or replacement time.

★*b. Tools.*

(1) A definite method of accounting for tools signed out from the unit toolroom will be used. A sign out book can be used for components of special tool sets and organizational maintenance sets. These items should be signed out for specific jobs and returned at the completion of the job or at the end of each day, depending on the unit SOP. General repairmen tool sets will be assigned to individual repairmen using a DA Form 2062, Hand Receipt—Annex No. These hand receipts will be filed in the toolroom in accordance with applicable supply publications.

(2) Unserviceable or broken tools will be turned in to the unit technical supply by the individual to whom it is assigned. The supply clerk will either issue a serviceable tool or a receipt for the unserviceable tool and order a like item. Items which are turned in permanently will be removed from the individual's hand receipt.

(3) Every effort must be made to furnish the repairman with a complete set of handtools and special tools to perform his job. The repairman can conform with supply economy by using each tool for the purpose for which it was designed; the supervisor can help the repairman by recognizing the misuse of tools and the use of tools that are unsafe to the repairman as well as to the equipment. TM 9-243, "Use and Care of Hand Tools and Measuring Tools," will be readily available for reference by maintenance personnel. A repairman's tool set that is complete and in good condition shows excellent practice in conservation of materials. Some common tool deficiencies are—

- (a) Broken screwdrivers.
- (b) Wornout files.
- (c) Broken hammers.

(d) Wrenches with cracked, broken, or sprung jaws and sockets.

(e) Wornout ratchet handles.

(f) Spanner wrenches with defective hooks or pins.

(g) Allen wrenches which are broken or filed to an off size.

(h) Excessively worn or misaligned plier jaws.

(i) Diagonal cutters (dikes) with broken or misaligned cutting surfaces.

(j) Needle-nose pliers with worn or misaligned jaws.

(k) Cross-point screwdrivers with worn points.

(l) Broken handles on handtools.

(m) Broken or worn points on punches.

(n) Broken, mushroomed, or misshaped heads on chisels.

(o) Incomplete steel tapes.

(p) Inaccurate feeler gages.

8-17. Return of Material

a. *Serviceable Equipment.* Uninterrupted supply support depends upon timely return of replacement components by the using unit. These components pass through supply channels to the appropriate commercial contractor, Army general depot, or overhaul facility. Forecasts of reparable returns from using units provide basic planning data for the stock control point in establishing workload requirements at contractor and Army depot repair facilities. Reparables not available at the overhaul facility can disrupt schedules and require revision of plans by Headquarters, Department of the Army.

b. *Unserviceable Equipment.* Aircraft equipment which cannot be repaired by the using organization is removed from the aircraft and tagged with an applicable materiel condition tag in accordance with TB 750-126 and accompanied by DA Forms 2408-16 and/or 2410, as appropriate. Tagging of materiel with materiel condition tags will be in accordance with TB 750-126. When an item is an EIR exhibit or a direct exchange item, it will be accompanied by a DA Form 2402 in addition to the materiel condition tag. The habitual practice of keeping repair parts in supply channels will make them available when needed.

c. *Prompt Turn-In.* Organizational maintenance units will operate within basic stock allowances and expedite the prompt turn-in of all repairable and unserviceable equipment.

d. *Prompt Evacuation to Higher Maintenance Units.* Repair beyond the scope of organizational maintenance will be evacuated to the next higher maintenance activity. Unserviceable organizational repair parts, other than those having no reclaimable value, are replaced by direct exchange.

★8-18. Materiel Condition Tags

Materiel condition tags will be completed and attached to all aeronautical and air delivery items as prescribed by TB 750-126. This publication applies to all Army activities using, maintaining, stocking, storing, and issuing Army aeronautical and air delivery equipment.

CHAPTER 9

MAINTENANCE OF ARMY AIRCRAFT UNDER EXTREME WEATHER CONDITIONS

9-1. Desert

a. Sand and Dust. The chief maintenance problems in desert operations are caused by sand and dust. When aircraft land and take off, sand and dust are drawn into running engines. These particles act as abrasives on internal parts and adhere to lubricated parts, causing excessive wear. Transparent materials such as plastic windows are pitted by blowing sand, resulting in reduced visibility. To minimize damage caused by extreme heat, sand, and dust—

(1) Maintenance sites must be selected on the hardest ground available.

(2) Engine runup test stands should be on concrete, if possible; if not, over a pit filled with rocks or a surface covered with tarpaulins.

(3) Landings and takeoffs should be made near mooring points to reduce taxiing.

(4) Engines should not be operated at high speeds over loose sand.

(5) Engine openings should be covered as soon as the engine is stopped.

(6) Oil servicing equipment should be kept in a covered, compact box to keep the equipment free from sand.

(7) Air filters should be inspected often. A clean, extra filter must be available for change during field stops.

(8) Engines must be cleaned daily.

(9) Control cable tension must be checked closely. Aircraft structural materials will expand more than cables in extreme heat, thus tightening the cables.

(10) Pressure in oleo struts must be checked to prevent damage to hydraulic seals.

(11) The compass fluid level must be checked often.

(12) When starting the engine, it should be *underprimed* rather than overprimed; amount of prime should be increased as needed.

(13) To prevent seizure, parking brakes must not be applied until brakes have cooled.

(14) Aircraft should be parked in the shade, and loose rather than tight covers must be used to protect windshields from damage.

(15) A close check should be kept on oil consumption to alert maintenance personnel for possible engine change when oil consumption exceeds normal.

(16) Frequent purging of bearings should be accomplished to force out abrasive materials.

b. Field Expedients.

(1) Helicopter tail rotor leading edges may be damaged by sand. To minimize damage, the leading edges may be covered with cloth-backed tape cut in equal lengths (to preserve balance). The tape should be changed when necessary.

(2) To protect control linkages from sand (especially the tail rotor pitch change links), they should be covered with chamois secured with safety wire. *Do not impede normal movement of the parts.* This linkage should be inspected regularly to insure that sand is not getting inside the covering.

9-2. Tropical

a. General. General precautions used in desert operations should be followed in jungle and delta operations. The high humidity normally encountered in lowland jungles and in delta areas creates additional maintenance problems. All equipment directly exposed to the weather may be damaged by the hot, humid climate and

such equipment requires additional care. Rock and coral surfaces increase tire wear. Poor trafficability impedes maintenance efforts. Clay-type mud creates excessive cleaning problems. Hardstands must be specifically prepared and well drained. Heavy rains, intense heat, and nuisance insects impede maintenance and may cause mechanics to slight their work.

b. Fungus. To prevent fungus damage to electronic equipment, procedures specified in appropriate equipment technical manuals should be followed when applicable. Fungus growths start rapidly on all wood and fabric parts of an aircraft and can be detected only by constant inspection of all portions of the aircraft. This growth will weaken and rot spars and other structural members. Material on which fungus is found must be closely examined and repairs made to prevent structural failure in flight.

c. Rust. High humidity will cause metal parts to corrode quickly. A coating of grease affords some protection; however, these parts must be constantly inspected and grease replaced to prevent adherence of dust particles to the surface, with consequent wear of the part.

9-3. Arctic

a. General. Low temperatures in the Arctic require special practices and maintenance techniques for efficient aircraft operation. Special equipment is required both for the aircraft and for those performing maintenance upon it. In addition to the procedures described in *b* through *h* below, the following must be habitually practiced:

(1) Before flight, snow and ice must be removed from aircraft surfaces. Only authorized deicing equipment will be used.

(2) Moving parts must be lubricated with lubricants recommended for temperatures existing in the operational area.

★(3) Before starting engine, heat must be applied to engine(s), instruments, and components.

(4) The oil dilution system must be used to aid engine starting.

(5) Maintenance personnel must wear gloves when working on parts of the aircraft or metal materials in extremely low temperatures.

(6) Work shelters must be provided for maintenance personnel.

(7) Protective covering must be provided for the engine, propeller, and other portions of the aircraft.

(8) Exposed portions of shock struts must be free of ice and properly lubricated with hydraulic fluid at all times.

b. Preheater. A standard combustion-type portable preheater is issued in cold climates. It is used to heat the maintenance tents and working areas, and to—

★(1) Apply heat to the engine component case, carburetor, induction system, and oil sump before starting engine.

(2) Melt ice under protective aircraft covers before their removal. Heat may be applied directly to the frozen area or to the entire wing through the wing inspection plates.

Note. Protective covers must be thoroughly dry when not in use and must be stored in a warm, dry place.

★(3) Apply heat to selected areas of the aircraft to permit repairmen to work without gloves for reasonable periods of time.

c. Preflight Preparations. In preflight preparations, it should be determined that—

(1) Adequate survival gear is aboard the aircraft.

(2) Flight controls are not frozen or jammed with ice.

(3) Wing surfaces are free of snow and ice. *Takeoff will not be attempted until wings are clean.*

(4) Hydraulic brake lines are not cracked or broken.

(5) Fuel tank vents and oil breathers are free of ice.

d. Engine Starting and Warmup. When starting engines in low temperatures, the following precautions should be taken:

(1) Use auxiliary power unit (APU) on aircraft so equipped.

(2) Use oil dilution during engine warmup to prevent excessive oil pressure.

(3) Use carburetor heat only when required for fuel vaporization.

(4) Use additional traction materials on

an icy surface to prevent sliding of wheels, skis, and/or chocks.

- (5) Allow 5 to 10 minutes between unsuccessful starting attempts. At times, it will be necessary to remove one spark plug from each cylinder and apply heat to rid it of ice accumulated during starting.
- (6) Thirty seconds after starting engine, if oil pressure is not indicated, stop engine immediately and apply heat to oil transmitter line and oil feed line if congealed oil is suspected.
- (7) If oil foam seeps from crankcase breather, reduce engine rpm.
- (8) Adjust engine rpm to insure generator operation.
- (9) Never turn on radios or electrical equipment until generator is operating; use an APU.
- (10) Check suction gage after starting to ascertain that drive shaft of vacuum pump has not sheared.
- (11) Use primer as needed to assure a smooth-running warmup.

e. After Flight. To lessen condensation of moisture in fuel tanks, the tanks must be filled through an appropriate filter immediately after flight and before aircraft is parked for the night. If aircraft are not equipped with oil dilution systems, engines having a self-contained oil supply can be drained at the end of the day's operation and the oil heated prior to replacing in the engine. In addition, the following procedures will be used:

- (1) Shock struts will be cleaned and lubricated with hydraulic fluid.
- (2) Sumps will be drained of water accumulations.
- (3) The engine will be operated at low rpm to cool it prior to dilution of oil and shutdown. Premature shutdown causes improper oil dilution and may cause the pistons to seize in the cylinders.

Caution: When using the oil dilution system, procedures outlined in the applicable -10 TM or aircraft engine publication should be followed.

- (4) Stressed parts will be examined carefully. (Metal becomes brittle in cold temperatures.)

- (5) When not in use, aircraft batteries will be removed and stored in a warm place.
- (6) Survival gear should be removed from the aircraft.
- (7) Protective covers will be wrapped securely around the engine at night.
- (8) To prevent the carburetor butterfly valve from freezing in the closed position, the throttle will be left partially open after stopping the engine.

f. Parking or Mooring. While parking or mooring aircraft, these precautions should be followed:

- (1) Layers of paper, rags, straw, brush, or other insulating material should be placed under tires or skis.
- (2) Spoilers should be used on wings.
- (3) After taxiing through slush or water, parking brakes should be released to prevent freezing in the braked position.
- (4) To prevent frost formation on windshield and windows, one window should be left partially open to equalize inside temperatures with those outside.
- (5) If permanent mooring rings are not available, ice bridges may be constructed to secure the mooring ropes, or the "dead man" method of mooring (FM 31-70) may be used.

g. Field Expedients.

- (1) Snow and frost may be removed from aircraft surfaces with a broom or by pulling a rope fore and aft over the wings while moving it spanwise in a sawing motion.

Caution: Care must be exercised to prevent damaging the pitot head and flight control surfaces.

- (2) An aircraft engine may be preheated adequately by using blowtorches, lengths of stovepipe, stovepipe elbows, and an engine protective cover.

Caution: Direct blowtorch into stovepipe rather than directly to the engine.

h. Further Precautions. Personnel should take the following precautions:

- (1) If the aircraft is not equipped with an oil dilution system, ground run the engine at short intervals.
- (2) If oil or fuel is accidentally spilled on clothing, move to a heated shelter and remain there until oil has been removed or the spilled fuel has evaporated.
- (3) To maintain proper operating temperatures, install standard winterization equipment on aircraft, and baffles on the oil cooler.
- (4) After the aircraft is aloft and operating temperatures have adjusted, test the flow of fuel from all tanks before leaving the vicinity of the field.
- (5) Torque all bolts to minimum tolerances. As the engine heats, expansion will seal minor oil leaks.
- (6) When taxiing, watch for obstacles obscured by snow.
- (7) Taxi slowly and carefully, using power as necessary. Use brakes sparingly.
- (8) Since taxiing will cause the engine to cool, insure that engine is at operating temperature before takeoff.
- (9) Apply pitot heat while taxiing to insure that pitot static head will function.
- (10) When there is a temperature inversion, expect a sudden frosting of the windshield while climbing from the field.

Caution: Vacuum-operated instruments may be unreliable due to bearing drag caused by congealed instrument lubricants.

- (11) Operate flaps several times after take-off to keep them from freezing in the UP position.
- (12) With propeller pitch control, reduce engine rpm 300 below cruise every 30 minutes to preclude oil congealing in propeller cylinder or pitch change motors.
- (13) Expect the magnetic compass to be unreliable when in close proximity to the North Pole.
- (14) When ice has formed on the aircraft, approach and land at a higher air-speed than normal.

- (15) When landing on clean snow, judge height above the ground by reference to surrounding obstacles.
- (16) Use brakes with extreme caution. When brakes are applied, snow may build up ahead of the wheels, causing aircraft to nose over.
- (17) To avert engine failure in event of a go-around, maintain operating oil and cylinder head temperatures during descent.
- (18) Be alert to the danger of static electricity built up on the bodies and clothing of servicing personnel. Have them drain off static electricity by touching metal surface of aircraft with bare hands before fueling.

Caution: Contact of bare skin with very cold metal must be avoided to preclude injury.

- (19) Be alert for fuel with a lower octane rating than that marked. Octane is sometimes lowered due to deterioration in long storage.
- (20) Exercise caution while retracting landing gear during operation from slush until water has been removed by normal airflow over the gear. Retraction of gear too quickly may lead to freezing of gear-up locks and prevent extending gear when desired.

9-4. Mountain or High Altitude Conditions

a. General. The altitudes involved in mountain flying usually require climb and cruise at full throttle, which causes engine strain and a general loss of engine efficiency.

b. Condensation. Since condensation results from rapid changes in temperature, fuel must be closely checked for water content, sumps drained often, and fuel tanks kept as full as possible.

c. Routes of Communication. Since routes of communication may limit supply, major maintenance should be accomplished in rear areas where necessary parts and equipment are available.

9-5. Salt Air

In the vicinity of salt water, corrosion of aircraft metal parts must be controlled by paint-

ing or coating with a corrosion-preventive compound. Every inspection will include detailed inspection of all metal aircraft parts and corrective maintenance to control rust and corrosion.

a. Aircraft operating over or near salt water should be washed with fresh water after each flight.

b. Airplane propellers should be wiped with a coat of light oil during the daily inspection.

c. Adequate protective finish must be maintained on magnesium. Normally corrosion does not form on painted or protected surfaces, but bare magnesium alloys exposed to salt air will corrode rapidly. Affected areas are characterized by—

- (1) Blistering or cracking of the finish coating.
- (2) A white, powdered appearance.
- (3) Zinc chromate primer discoloration.

d. Although aluminum surfaces do not show evidence of corrosion if coated with a protective finish, corrosion will result from moisture permeating the paint and attacking the metal. Affected areas will generally be characterized by—

- (1) A scaly or blistered appearance of the finish.
- (2) A dulling and pitting of the area.
- (3) Whitish or reddish powdered deposits.

e. To differentiate between aluminum and magnesium alloys, apply one drop of ordinary battery acid to the surface of the metal being tested. On aluminum no immediate reaction will occur; on magnesium the area will immediately show a foaming or boiling action, with black discoloration. *The tested area will be washed with water immediately to prevent flesh burns*

to personnel and continued acid reaction with the metal.

9-6. Hurricanes

AR 95-87 covers the evacuation of Army aircraft based in a hurricane zone. Aircraft that cannot be evacuated must be headed into the wind and protected as indicated below.

a. *Spoilers.* Spoilers are used to spoil the flow of air over the wing surfaces. These may be constructed from 2- by 4-inch lumber and padded to protect the aircraft surface. Best results are obtained when spoilers are lashed to the top of wing surfaces about 12 inches behind the leading edge.

b. *Other Precautions.* Trucks with tarpaulins, strategically placed around the aircraft, will provide protection from flying debris and break the force of the wind. When hail is expected, aircraft must be covered.

9-7. Mooring

a. *Method.* The applicable aircraft -20 TM should be consulted for proper placement of ground anchors. Two mooring ropes, hemp or nylon, at least one-half inch in diameter should be used. These ropes must be inspected frequently for signs of wear. Tiedown ropes must be tied to allow for shrinkage due to moisture; knots must be secure but of a type easily untied. To half-hitches in the mooring ring, with the loose end of the rope secured, is the normal technique. Chocks, wheel boxes, or wheel holes must be provided to restrict the aircraft; all control surfaces must be locked.

b. *Field Expedient.* If the aircraft is in an area where no tiedown facilities are available, 55-gallon drum(s) filled with water and tied under each wing may be used as a temporary tiedown.



1

2



3

4



CHAPTER 10

GROUND SAFETY IN MAINTENANCE WORK

10-1. General

a. The Safety Program. Safety rules and regulations prescribe safe methods and practices for insuring continuous production, safeguarding personnel, and preventing property damage. Although safety is the responsibility of the unit commander, each individual in the unit must be safety-conscious. Each echelon of command will supervise and teach personnel to work safely, eliminate hazards, enforce safety regulations, and investigate accidents.

b. Safety Education. Safety education is a mandatory phase of accident prevention. It helps to develop an internal safety consciousness which, when properly ingrained, will function in any situation. Through this medium, accidents may be prevented which engineering, supervisory, or enforcement measures would not eliminate. Each accident is a symbol of some deficiency which should have been corrected *before* the accident. The "post mortem" safety program is a phase of safety education which stresses corrective action *after* an accident.

c. Accident Reporting and Investigation. Immediate investigation, reporting, and analysis of all accidents which result in injury or property damage are essential elements of an accident prevention program.

(1) AR 385-40 outlines the procedures for reporting accidents to higher headquarters.

(2) Correcting causes of minor incidents will help prevent more serious accidents. Even minor incidents which do not require formal reports to higher headquarters should be investigated to determine the cause and necessary corrective action taken to prevent recurrence.

10-2. Prevention of Accidents

Accidents are prevented primarily by improv-

ing the individual's knowledge, skill, attitudes, and habits. Safe living requires the ability to function at optimum level in the presence of necessary hazards. Basic safety rules to observe while performing the maintenance include—

- a. Eliminating "horseplay."
- b. Being alert at all times.
- c. Wearing clothing that fits properly.
- d. Removing all jewelry before going on duty.
- e. Using all available safety guards.
- f. Using prescribed methods when moving heavy objects.
- g. Using the right tool for the right job.

10-3. Safety Considerations

The maintenance supervisor must establish high maintenance standards which will eliminate loss of aircraft operational time caused by faulty maintenance. Every member of the unit must practice shop and flight-line safety. A partial listing of practices which should be followed by all shop and flight-line personnel is discussed below.

a. Flight-Line Safety Practices.

★(1) Aircraft will be started, run up, or tested only by qualified aviators or qualified repairmen delegated this duty by the unit commanding officer. A list of such repairmen will be posted on the bulletin board, accessible to all aviators and repairmen (AR 95-13).

(2) Observe all WARNING and DANGER signs.

(3) Move the controls of an aircraft only when necessary. Before moving any controls, check to be sure that no one is working on the aircraft.

(4) Check for the bend radius allowed for each diameter measurement of Teflon hose. Any excess bending may crimp the liner and partially block the hose.

(5) Brief passengers on the dangers of being hit by the rotor blades when entering or leaving a helicopter.

(6) Brief all personnel who are operating in the area on the places where aircraft will be landing and taking off.

(7) Be alert for possible grass fires ignited by the engine or heater exhaust system.

(8) Be alert for hazardous exhaust temperatures and velocity of turbine engines when working on, operating, or taxiing aircraft equipped with turbine engines.

(9) Never leave the cockpit of any aircraft before double-checking that the magneto switch is in OFF position.

(10) Do not work under an aircraft suspended from a hoist without first blocking under the fuselage.

(11) Never walk near the arc of a propeller; be careful around aircraft during engine runup.

(12) Do not climb or stand on any part of an aircraft except those parts marked for so doing.

(13) Avoid using the tail rotor guards to rock observation helicopters in order to get the wheels down. See pertinent maintenance publications for proper method of ground handling these helicopters.

(14) Do not rotate main rotor by using tail rotor. The reverse load is detrimental to the tail rotor drive system.

(15) Do not yank rotor blades around with a rope. This can damage the pockets and spars.

(16) Do not tie down blades more than 6 inches below their normal position.

(17) Do not pull rotor through by the blade tips; pull it through from the rotor head.

(18) Never disconnect a control or take out part of the control system without tagging the cockpit controls.

(19) Do not jack an aircraft in high winds or with personnel inside.

(20) Never leave gasoline in an open container. Gas fumes are heavier than air and on a hot windless day can cause a fire many feet from the source of the fumes.

(21) Do not breathe gasoline fumes; avoid spilling gas on clothing or skin.

(22) Do not lubricate dirty fittings, use a

dirty grease gun or containers, or work with dirty hands. The law of lubrication is to *keep everything clean*.

(23) Avoid using grease from a container until the container is wiped clean around the lid, plug, or cap.

(24) Do not use hydraulic fluid from a can which has been permitted to stand opened and unprotected.

(25) Leave lube container closed when not in use. Tighten the cap or plug on a drum with a wrench; hand-screw the cap on a can as tight as possible.

(26) Do not paint the bubbles of observation helicopters for protection from the sun. This is not an authorized practice and obstructs the vision of both aviator and observer personnel.

b. Shop and Hangar Safety Practices.

(1) Hand tools.

(a) Racks, shelves, and/or toolboxes must be provided for tools not in use to assure immediate accessibility and to eliminate the hazards created by misplaced or forgotten tools.

(b) When tools are used on ladders, scaffolds, platforms, or other elevations, special precautions will be observed to prevent them from being dropped from or falling from these levels.

(c) Tools will be inspected frequently by responsible personnel and defective tools removed from service for repair or salvage.

(d) Tools with sharp cutting edges will be carried in protective covers.

(e) All power tools must be equipped with guards, all electrical contacts on power tools inclosed, and all wiring well insulated and grounded.

(f) Exposed sharp edges should be smoothed down on completion of work.

(g) Improvised ladders such as packing cases or barrels should not be used.

(h) When parts or items have been removed from aircraft, careless placement about the work area should be avoided. The items should be stowed out of the way or marked so they can be plainly seen either day or night.

(i) Sharp edges of material stored should not protrude.

(j) Electric drills should not be used inside an aircraft without taking precautionary measures (good ventilation and removal of combustible material and substances) to eliminate fire hazards. The commutator gives off sparks and is a potential source of ignition.

(k) Nuts and bolts should be torqued as outlined in appropriate TM. Over-torquing results in destroyed or broken parts.

(2) *Welding and cutting equipment.*

(a) During welding or cutting operations, extreme caution will be observed to prevent sparks from starting fires. A fire extinguisher should always be available during these operations.

(b) Safety goggles will be provided for operators of oxyacetylene equipment.

(c) During electric welding operations, the operator will wear a hand shield or helmet with a shaded filter glass, protective sleeves, gloves, and apron. When other personnel are in the vicinity, these operations will be screened off.

(3) *Housekeeping.*

(a) Covered fire-resistant rubbish cans will be used.

(b) Self-closing covered metal waste cans will be conveniently located about the work area for the disposal of oily rags and waste.

(c) Volatile flammable liquids will not be used for washing or cleaning parts and must not remain in open containers. Working quantities of such liquids will be confined to approved containers.

(d) Dripping or spilling of oil should be prevented and drip pans or other suitable means should be provided to collect excess oil.

(4) *Acids.*

(a) Rubber gloves, goggles, and aprons must be provided for all personnel handling battery acids.

(b) Where acid fumes have a toxic, corrosive, or asphyxiating action, approved respirators will be available.

(c) Slaked (hydrated) lime should be available for neutralizing large quantities of acid in the event of spillage or breakage of containers. For cleaning acid from floors or equipment, a 10 to 20 percent sodium carbonate

solution should be used. All places made slippery by acid may be adequately neutralized with soda or other alkaline solution and washed with water.

(5) *Static ground.* To reduce the possibility of fire from accumulated static electricity, all aircraft stored in hangars will be provided with proper grounding devices and will be grounded at all times.

(6) *Smoking.* Smoking will not be permitted within 50 feet of hangars, parked aircraft, and flammable liquid storage points, or inside hangars. "No Smoking" signs will be conspicuously posted in restricted areas. The commanding officer may designate specific areas where smoking is permitted.

(7) *Fire extinguishers.*

(a) Approved type, conspicuously marked fire extinguishers will be provided in hangars and on flight lines.

(b) All fire extinguishers will be properly charged and periodically tested, ready for instant use.

(c) All unit personnel will be trained in the proper use of fire extinguishers.

(8) *Ejection seats.* Safety precautions pertaining to specific ejection seat systems may be found in the -10 and -20 TM's on the aircraft in which they are installed. When performing the tasks listed below, maintenance personnel must be familiar with and practice all safety precautions:

(a) Removing and installing ground safety lock pins.

(b) Removing ejection seat(s) from aircraft.

(c) Disarming seats prior to removal.

(d) Disconnecting items before removing seat(s).

(e) Replacing seat in aircraft and loading cartridges.

10-4. Fuel Handling and Aircraft Service

a. Safety precautions required in this operation cannot be overemphasized. Personnel involved in the handling of aviation fuels, oil, etc., are continually subjected to health, fire, and explosion hazards.

★b. To prevent the loss of life and/or expensive equipment, fuel handlers and supervisors must be thoroughly familiar with their

duties. A unit training program must be established to insure that all personnel involved in fuel handling and aircraft servicing are standardized in the proper procedures and safety precautions required in this operation. TM's

10-1101 and 10-1113 are excellent guides for the operation of specific petroleum handling equipment. TM 55-1500-311-25 outlines procedures for aircraft servicing, to include fueling, defueling, oil servicing, oxygen servicing, etc.

CHAPTER 11

QUALITY CONTROL

Section I. MAINTENANCE STANDARDS

11-1. General

The organizational maintenance officer must insure that no faulty maintenance is performed by any member of the unit and that any aircraft released is safe for flight. Faulty maintenance such as incomplete preflight inspections, improperly assembled parts, an oil change that is past due, or a minute unnoticed crack in the airframe may result in an aircraft accident.

11-2. Maintenance Abuses and Faulty Practices

Practices which result in faulty maintenance include—

- a. Lack of adequate inspections and supervision.
- b. Improper or negligent use of material and equipment.
- c. Lack of lubrication, overlubrication, or use of improper lubricants.
- d. Use of too much pressure when greasing rotor heads, thereby blowing out the seals.
- e. Deferred maintenance.
- f. Improper servicing and adjustment.
- g. Repair by unqualified personnel.
- h. Use of improper or inadequate tools and/or equipment.
- i. Tinkering with an otherwise satisfactory assembly.
- j. Oil dilution.
- k. Continuous use of full throttle.
- l. Taxiing with brakes.
- m. Rough treatment of delicate assemblies.

11-3. Factors Affecting the Army Maintenance System

To develop an efficient Army maintenance system, the commander must—

- a. Have a thorough knowledge of preventive maintenance (PM).
- b. Provide time for PM, PM training, and personal inspections.
- c. Have trained personnel available to perform PM.
- d. Motivate his personnel to do their work with precision and enthusiasm.
- e. Keep a constant check on control of tools, status of parts supply, and availability of current publications.
- f. Provide adequate facilities for the performance of all phases of PM which fall within the responsibilities of his organization.
- g. Assure that applicable forms and records are maintained in accordance with TM 38-750.
- ★h. Assure that applicable materiel condition tags are utilized in accordance with TB 750-126.

11-4. Prevention of Faulty Maintenance

Faulty maintenance can be prevented by *proper supervision, training, high morale, and cleanliness.*

a. *Supervision.* Adequate supervision is one of the best methods of preventing faulty maintenance. One supervisor for three to seven subordinates is recommended.

★b. *Training.* Maintenance personnel must be continually trained because of changes and alterations in aircraft and components. A repairman should *always* use a checklist for every maintenance function performed.

★c. *High Morale.* Personnel with high morale contribute to the efficiency of an organization. A repairman who has pride in his work will make fewer errors.

★d. *Cleanliness.* Cleanliness of the repair-

man, his tools, and his work area contribute to the quality of maintenance. An efficient, well-trained repairman keeps himself as clean and greasefree as possible. When a job is completed, his tools are cleaned, his work area is policed, and his aircraft is ready for inspection and flight.

11-5. Preventive Maintenance (PM)

a. Preventive maintenance (PM) is the care and servicing by personnel for the purpose of maintaining equipment and facilities in satisfactory operating condition by providing for systematic inspection, detection, and correction of incipient failures either before they occur or before they develop into major defects.

b. Prevent maintenance is the basic element of the maintenance system. The user must operate equipment properly and must inspect, clean, lubricate, tighten, and adjust it on a systematic basis. Even minor repairs and parts replacement authorized at the organizational maintenance level are preventive in scope, and designed to forestall more complex repairs.

c. Maintenance operations require systematic inspection by the supervisor. He should pay close attention to the planning and execution of the unit's preventive maintenance program. Areas to be considered include—

★(1) Capability of individual repairmen to perform checks and repairs efficiently.

★(2) Efficient assignment of work. Are qualified repairmen supervising the work of less qualified personnel?

(3) Scheduling and flexibility of maintenance; how deferred maintenance is handled.

(4) Availability of aircraft for flying.

(5) Adequacy of facilities with reference to the tactical situation. Shelter, heat, light, and power should be provided for the most comfortable working conditions possible. Many times this will require ingenuity and imagination on the part of the supervisor.

11-6. Preventive Maintenance (PM) Indicators

PM indicators are selected inspection points which indicate, but do not completely establish or confirm, the preventive maintenance status

of equipment. These indicators are not a substitute for a thorough inspection, but are a quick, easy way for the supervisor to keep a running day-to-day spot check on the maintenance of the equipment in his unit. PM indicators for selected items of equipment are contained in DA Pam 750-1. Indicators for some of these items of equipment are discussed below.

a. Aircraft.

(1) Every time the maintenance supervisor is on the line, he should be inspecting and checking for signs that will indicate how the standards of aircraft maintenance are being met. He must keep in mind the mission of the unit and the time and personnel available. DA Pam 750-1 contains basic instructions for inspecting some of the aircraft in the Army inventory. Because PM indicators are general in nature, a guide for one type of aircraft can be substituted for any aircraft.

(2) Proper markings, the absence of rust and dents, and cleanliness of equipment are an essential part of maintenance, as well as an indication of high morale and discipline. PM indicators which will affect the operation of the equipment include—

(a) Clogged lubrication points.

(b) Rust or dirt in bearings.

(c) Dirt which affects safe operation, such as on windows or mirrors.

(d) Dirty meters, gages, or dials, which will prevent proper readings by the operator.

(e) Grease or oil on rubber surfaces.

b. Avionics Equipment.

(1) Avionics equipment in Army aircraft requires close preventive maintenance supervision for operating efficiency and to prevent equipment repair by the avionics repair unit because of neglect in organizational maintenance.

(2) The use of preventive maintenance indicators when checking the equipment, antennas, headsets, and cordage assists the supervisor in determining whether or not PM is being performed on the avionics equipment as well as on the aircraft.

c. Tools. The Army maintenance and supply system provides the tools necessary for performance of the organizational maintenance

mission. The supervisor must know the nomenclature and use of maintenance tools and be able to recognize unauthorized tools.

(1) Lack of authorized tools in a unit is evidence of deficiencies in organizational maintenance. Either the maintenance is not being performed or it is being performed with improper tools, which may damage the equipment.

(2) The maintenance supervisor must prevent the hoarding of tools or possession of unauthorized tools. A spot check of isolated corners in a supply room may uncover tools unauthorized by type or quantity. Such tools may encourage unauthorized maintenance or substitution of tools. The maintenance supervisor should return unauthorized tools to the supply channel promptly; maintenance being performed by a higher echelon could be hampered by the lack of these very tools.

d. Auxiliary Equipment.

(1) DA Pam 750-1 contains examples of maintenance on equipment similar to that used by an organizational unit; these examples can be applied to the APU's compressors, generators, vehicles, battery charges, and pumps of the aviation section. General cleanliness, tightness, and lubrication is as necessary for the auxiliary equipment as it is for the aircraft. The supervisor should also check to insure that the proper type of fuel is being used in this equipment.

(2) The equipment operational record must be up to date to indicate the person responsible and whether or not the daily maintenance has been performed.

e. Publications.

(1) The maintenance supervisor should check on the availability of required publications. Missing publications may indicate that maintenance is not being properly performed. If shortages exist, a request must be submitted.

(2) After a manual has been distributed, a good indication of usage is its appearance,

e.g., if it is unsoiled, it probably is not being used enough.

f. Repair Parts.

(1) Repair parts are provided by the Army maintenance system, and indicate to a large extent the maintenance which the organizational unit is authorized to perform. The organizational maintenance unit should have on hand or on order at all times the repair parts authorized for stock in the pertinent -20P parts manual.

(2) Repair parts must be planned for and requested in advance. Inability to obtain required parts when needed delays repair and reduces the morale of maintenance personnel. Delay in delivery of parts is sometimes caused by difficulties encountered at higher levels of supply, but most delays are caused by carelessness and neglect. Examples of this type delay are—

(a) Repair parts are improperly identified on initial requests.

(b) Unauthorized and outdated supply manuals and erroneous stock numbers are used.

(c) Parts tags and requests are improperly filled out.

(d) Requesting is delayed until the last possible minute.

(e) Requirements for repair parts are allowed to accumulate.

(f) Requests are delayed at some other level in the supply chain.

(g) Supply personnel are inadequately trained.

(3) Since availability of authorized repair parts is a fundamental indication of the maintenance efficiency of the unit, the supervisor must be familiar with—

(a) His unit's authorized level of repair parts.

(b) Requesting procedures and be able to trace any undelivered part in the channels of supply.

Section II. TECHNICAL INSPECTIONS

11-7. Quality Control Through Technical Inspections

a. Frequent and competent technical inspection of aircraft maintenance and equipment is

the basis for good quality control. Repeated rejects on final inspection indicate quality control laxity, which adversely affects organizational efficiency.

★*b.* As maintenance on the aircraft progresses, the work is continuously inspected. When the crew chief or repairman reports an aircraft ready for flight after maintenance, the technical inspection will check for quality and completeness of work and general condition of the aircraft. Test flight is performed in accordance with TB AVN 23-16 and the appropriate aircraft -10 TM.

c. Technical inspections will also reveal faults that require the replacement of a repair part. Any repair part needed in the maintenance of aircraft must be requested immediately.

11-8. Types of Inspections

The two types of inspections performed on organizational equipment are *command* maintenance management and *spot check*. AR's 750-1, 750-5, and 750-8 prescribe procedures for conducting these inspections.

a. Command Maintenance Management Inspections (CMMI). These inspections are designed to provide commanders with an indication of the maintenance operational efficiency of each subordinate unit or activity, and to measure the proficiency and effectiveness of organizational and support maintenance units. This evaluation of maintenance operations is obtained through inspection of sample items of materiel for physical condition and inspection of maintenance practices and procedures.

★*b. Spot Check Inspections.* These inspections are conducted periodically by the commanding officer of the aircraft support maintenance facility to determine the condition of aircraft maintenance records, and technical supply and maintenance operating procedures of the Army aviation section. These inspections may be executed in conjunction with maintenance and supply assistance service (AR

700-4). At the conclusion of the inspection, deficiencies and necessary corrective action will be reported to the aviation officer.

11-9. Technical Inspector (Organizational)

The duties of the technical inspector in the maintenance section of an aviation unit are determined by the aircraft maintenance officer and are based on the type of unit and its needs. He will perform all technical inspections on assigned aircraft and equipment and will determine the serviceability of removed parts prior to their turn-in. He must inspect and sign off all red X and circled red X conditions on the DA Form 2408-13 before the aircraft is flown. Also, he will inspect all unit maintenance at specified intervals to insure that a high standard of maintenance prevails. The technical inspector must be trustworthy, respected by other mechanics, and thoroughly trained in his MOS. He is the direct representative of the unit commander and the maintenance officer and must keep them informed on the effectiveness of the maintenance system at all times.

11-10. Technical Inspector (Support Maintenance)

★The technical inspector in a support maintenance unit performs technical inspection of aircraft for all levels of maintenance upon receipt from and prior to return to using units. He establishes quality control procedures, inspects engines, components, systems, and instruments for wear and evidence of damage, and determines parts required. He also inspects items to determine that repairs are adequate. In addition to his duties as an inspector, he performs administrative and supervisory duties and aids production control personnel in the coordination of maintenance section workflow and the control of work distribution.

APPENDIX I

REFERENCES

★A-1. Army Regulations (AR)

11-14	Logistic Readiness.
95-13	Safety Procedures for Operation and Movement of Army Aircraft on the Ground.
95-16	Weight and Balance—Army Aircraft.
95-26	Aircraft Firefighting and Rescue.
95-87	Aircraft Hurricane Evacuation.
220-1	Unit Readiness.
310-1	Military Publications: General Policies.
310-3	Preparation, Coordination, and Approval of Department of the Army Publications.
310-32	Organization and Equipment Authorization Tables, Personnel.
320-5	Dictionary of United States Army Terms.
320-50	Authorized Abbreviations and Brevity Codes.
350-5	Military Education and Schools.
380-5	Safeguarding Defense Information.
385-series	(Safety.)
600-200	Enlisted Personnel Management System.
700-4	Supply and Maintenance Technical Assistance Program.
700-15	Preservation, Packaging, and Packing.
700-18	Repair Parts, Special Tools, and Test Equipment Allocation and Allowances.
700-26	Designating, Redesignating and Naming Military Aircraft.
710-12	Army Aircraft Inventory, Status, and Flying Time (Reports Control Symbol AMC-130).
710-50	Return of Critical and Intensively Managed Secondary Items.
711-16	DSU/Installation Stock Control and Supply Procedures (Army Field Stock Control System).
725-14	Maintenance Float Aircraft.
725-50	Requisitioning, Receipt, and Issue System.
735-35	Supply Procedures for TOE and TDA Units or Activities.
735-35-1	Issue Priority System.
740-12	Covered and Open Storage of Supplies
750-1	Maintenance Concepts.

750-5	Organization, Policies, and Responsibilities for Maintenance Operations.
750-6	Maintenance Planning, Allocation, and Coordination.
750-8	Command Maintenance Management Inspections (CMMI).
750-10	Materiel Readiness (Serviceability of Unit Equipment).
750-23	Premature Removal of Installed Aircraft Engines.
750-31	Technical Publications for Aircraft Files.
750-50	Use of Controlled Cannibalization as a Source of Repair Parts for Supply Augmentation.

★A-2. Field Manuals (FM)

1-5	Aviation Company.
1-15	Divisional Aviation Battalion and Group.
1-100	Army Aviation Utilization.
5-20	Camouflage.
21-5	Military Training Management.
21-6	Techniques of Military Instruction.
21-30	Military Symbols.
29-20	Maintenance Management in Theaters of Operations.
29-22	Maintenance Battalion and Company Operations (Nondivisional).
29-30	Maintenance Battalion and Company Operations in Divisions and Separate Brigades.
31-70	Basic Cold Weather Manual.
101-10-1	Staff Officers' Field Manual: Organizational, Technical, and Logistical Data—Unclassified Data.
(C)101-20	United States Army Aviation Planning Manual (U).

★A-3. Technical Manuals (TM)

1-series	(Aviation.)
5-200	Camouflage Materials.
5-315	Firefighting (Structures, Aircraft, Petroleum, and Nuclear Material) and Rescue Operations in Theaters of Operations.
9-243	Use and Care of Handtools and Measuring Tools.
10-1101	Petroleum Handling Equipment and Operations.
10-1113	Petroleum Tank; Vehicle Operation.
11-series	(Signal.)
38-750	Army Equipment Record Procedures.
38-750-1	Maintenance Management: Field Command Procedures.

38-750-2	Maintenance Management: National Agency Procedures.
55-series	(Transportation.)
743-200-1	Storage and Materials Handling.

★A-4. Department of the Army Pamphlets (DA Pam)

108-1	Index of Army Films, Transparencies, GTA Charts, and Recordings.
310-series	(Military Publications Indexes.)
350-10	U.S. Army Formal Schools Catalog.
750-1	Preventive Maintenance Guide for Commanders.
750-38	TAERS—Equipment Historical Records With Selected Maintenance Forms.

★A-5. Technical Bulletins (TB)

AVN 23-8	Reporting Criteria and Instructions for Processing Damaged or Deteriorated Aircraft.
AVN 23-13	Anti-Icing, Deicing, and Defrosting of Parked Aircraft.
AVN 23-16	Test Flights and Maintenance Operational Checks for Army Aircraft.
11-series	(Signal.)
55-1500-307-25	Aircraft Component Replacement and Re-Use Procedures.
55-1500-301-25	Army Aircraft Maintenance Inspections Procedures.
55-1500-304-25	Mutilation of Condemned Aeronautical Equipment Prior to Disposition.
55-1500-307-25	Aircraft Components Requiring Maintenance Management and Historical Data.
55-9150-200-25	Engine and Transmission Oils, Fuels, and Additives for Army Aircraft.
746-93-2	Painting and Marking of Army Aircraft.
750-126	Use of Materiel Condition Tags and Labels on Army Aeronautical and Air Delivery Equipment.

★A-6. Supply Bulletins (SB)

1-1	Army Aircraft Flying Hour Factors and Forecast.
708-21	Federal Supply Classification; Part I, Groups and Classes (Cataloging Handbook H 2-1).
725-28	Issue of Supplies and Equipment: Regulated Aviation Major Items.
55-series	(Transportation.)



...



APPENDIX II

SAMPLE GUIDE: MAINTENANCE AND TECHNICAL SUPPLY STANDING OPERATING PROCEDURES

(Classification)

Headquarters

Location

(Date) _____

STANDING OPERATING PROCEDURE

I. GENERAL

A. Scope.

The procedures covered herein pertain and apply to maintenance and technical supply activities for the unit.

B. Changes.

Recommended changes, deletions, and corrections should be reported to the maintenance officer.

C. Distribution.

To all personnel concerned with aircraft maintenance.

D. Posting.

Accessible to all personnel. Required reading is directed.

II. REFERENCES

A. Army Regulations.

(Listed by number, subject, and date.)

B. Department of the Army Circulars, Technical Manuals, Memorandums, and Directives from Higher Headquarters.

(Listed in numerical and alphabetical sequence.)

C. Field Manuals.

(Listed by number and paragraph.)

D. Unit Directives.

(Include all subjects considered by the commander to be important.)

III. MAINTENANCE OPERATIONS

A. Duties of Personnel.

B. Organization.

1. Shop operations.

2. Technical supply.

3. Toolroom.

4. Tech inspection section.

C. Assignment of Personnel.

D. Areas of Responsibility (Police).

E. Vehicle Responsibility.

F. Maintenance Scheduling.

G. Liaison With Support Maintenance.

(Classification)

IV. AIRCRAFT AND VEHICLE ACCIDENTS

- A. Reporting.
- B. Required Forms.
- C. Prevention.
- D. Accident Board.

V. HIGH WIND AND STORM PROCEDURE

- A. Types of Warnings.
- B. Warning Procedures.
- C. Notification of Personnel.
- D. Duties of Personnel.
- E. Security of Aircraft.
- F. Evacuation.

VI. INSPECTIONS

- A. Personal.
- B. Command.
- C. Spot Check.
- D. Technical.

VII. REPORTS AND RECORDS

- A. Reports.
 - 1. DA Form 1352.
 - 2. DA Form 2406.
 - 3. DA Form 2408-3.
 - 4. Other.
- B. Records.
 - 1. Responsibilities.
 - 2. Filing.
 - 3. Disposition.

VIII. POL PROCEDURES

- A. Storing.
- B. Inspections and Checks.
- C. Servicing Procedures.

IX. TECHNICAL SUPPLY

- A. Requesting.
- B. Storage.
- C. Issue and Turn-In.
- D. Toolroom Procedures.
- E. Return of Materiel.

X. SHOP AND LINE SAFETY

- A. Safety Program.
- B. Crash Rescue.

APPENDIX III

INSPECTION GUIDES FOR ORGANIZATIONAL MAINTENANCE AND TECHNICAL SUPPLY

Note. These inspection guides will assist the organizational maintenance officer in performing inspections. They are not intended to be regulatory and may be modified as required. Additional guidance is contained in DA Pam 750-1.

I. MAINTENANCE OPERATION TECHNICAL INSPECTION GUIDE

Section 1. GENERAL

1. Are maintenance records and facilities properly located in relation to each other and to the flight line? To the technical supply?

2. Is there a planned maintenance program actively supervised and controlled by a qualified maintenance officer?

3. Is the technical supply officer responsible to the maintenance officer?

4. Are necessary tools and repair parts for aircraft on hand and properly maintained?

5. Are working areas policed and free of safety hazards?

6. Are maintenance personnel properly supervised?

7. Are unauthorized tools and equipment on hand?

8. Does completed maintenance on aircraft undergo technical inspection prior to its release for flight?

9. Is there a clearcut SOP in effect between the repairman and technical supply?

10. Is lateral transfer of parts controlled?

11. Is there a suitable area set aside for maintenance personnel to work on records, study technical manuals, etc.?

12. Is the maintenance office set up in an orderly manner with the required charts, files, technical manuals, etc., and arranged for the most efficient utilization?

13. Other?

★Section II. COMPONENT REPLACEMENTS

14. Are scheduled component replacements made at the nearest scheduled inspection time?

★15. Are DA Forms 2410 initiated for applicable components upon removal from aircraft?

★16. Are components ordered in advance as specified in the maintenance SOP?

★17. Is proper procedure being used when component replacement time is extended?

★18. Is the component replacement chart correctly prepared and does it include all required items?

19. Are circled replacement times backed up by parts request slips or a letter of notification to the field maintenance activity?

20. Do the replacement times agree with those in DA Form 2408-16?

21. Is the "Aircraft hours to date" column kept current?

★22. Is the component replacement time circled when the accessory has been ordered?

★23. Is the field maintenance activity properly notified of component changes for which they will be responsible as required in the maintenance SOP?

24. Other?

Section III. ARMY AIRCRAFT INVENTORY, STATUS, AND FLYING TIME REPORT (DA FORM 1352)

25. Are all blocks of the heading properly filled out?

26. Are the authorized aircraft listed by category?

27. Does Column C show a code for each aircraft?

28. Does Column D reflect the correct number of accountable hours?

29. Does Column D equal the sum of Columns E and F?

30. Does Column F equal the sum of Columns G, H, I, J, and K?

31. Is the aircraft daily status chart correctly prepared and utilized as required?

32. Other?

Section IV. MAINTENANCE FILES

33. Are files neatly arranged and properly identified?

34. Are DA Forms 2408-13 for the current month filed in a separate folder?

35. Is the current DA Form 2408-16 for each aircraft filed with the records for that aircraft?

36. Are the aircraft forms for the previous 6 months properly filed?

37. Is a work request file maintained, with completed work orders separated from those in suspense?

38. Are the loose equipment checklist for the aircraft filed in the Equipment Log Book?

39. Is an EIR file maintained?

40. Is a file of Army Aircraft Inventory, Status, and Flying Time Reports maintained?

41. Are maintenance directives, memoranda, etc., properly filed for easy reference?

42. Are duplicate copies of parts request slips, with supply action indicated, kept for each aircraft?

43. Are the required aircraft publications, less the maintenance records, complete and filed in a suitable location?

44. Other?

Section V. AIRCRAFT STATUS

45. Is a record of the current aircraft maintenance status kept as indicated in the maintenance SOP or by an equally efficient system?

46. Is the following information reflected: Total aircraft hours, next inspection due, aircraft hours next inspection due, hours remaining to next inspection, and date and reason aircraft is grounded?

47. Is all information accurate and current?

48. Other?

Section VI. TECHNICAL MANUALS

49. Are technical manuals on hand and filed?

50. Are required technical manuals on hand or on request?

51. Are changes properly posted?

52. Is followup action taken when requests are ineffective?

★53. Is the current applicable DA Form 12-series on file and periodically reviewed?

Section VII. MATERIEL READINESS

54. Is equipment serviceability properly determined?

55. Are DA Forms 2408-3 submitted as prescribed?

56. Are DA Forms 2406 properly filled out and one copy submitted direct to the U.S. Army Maintenance Data Processing Center?

57. Are files maintained on ESC?

58. Are all forms and records for assigned equipment maintained in accordance with TM 38-750?

59. Are the procedures outlined in AR 11-14 being implemented and followed?

60. Does the unit profile indicate that the unit is combat ready?

II. TECHNICAL SUPPLY INSPECTION GUIDE

Section I. SUPPLY PROCEDURE (GENERAL)

1. Are supply facilities adequate?

2. Are supplies properly stored, identified, and safeguarded?

3. Are excess supplies on hand?

4. Are TOE and memorandum receipt items handled through tech supply?

5. Are supply files neatly arranged?

6. Are unserviceable, recoverable items allowed to accumulate in the maintenance area?

7. Are serviceable items, except common hardware and emergency items in the aircraft, kept in the supply room until needed?

8. Is close supervision exercised over the issue and receipt of parts?

★9. Are component replacement items for a particular aircraft marked and held for that aircraft until needed?

10. Are flammable items stored properly?

11. Other?

Section II. REQUESTING PROCEDURE

12. Is the DA Form 2765 properly prepared showing correct stock number and nomenclature, authorized amount (on hand and due in), basis, authority, type of request, property class, and tech service?

13. Are requests submitted when required?

14. Is correct procedure used to upgrade or downgrade requests?

15. Is correct lateral supply procedure used?

16. Are EDP requests for gradual wear items backed up by previously submitted requests?

17. Other?

Section III. TURN-IN PROCEDURE

18. Is the DA Form 2765 properly prepared showing correct stock number and nomenclature?

★19. Are unserviceable, recoverable items thoroughly cleaned, properly tagged, in accordance with TB 750-126 and promptly turned in?

20. Are unserviceable tags properly filled out showing reason and previous operating time?

21. Are EIR exhibits properly tagged?

22. Is only one property class entered on a turn-in slip?

23. Other?

Section IV. STOCK LEVELS

24. Are stock levels based on usage factor?

25. Are letters of authorization on file to back up changes in stock level?

26. Are stock level adjustment made when usage varies because of weather or special operation?

27. Are requests for items which are normally field maintenance responsibility backed up by a letter of authorization from the responsible field maintenance officer?

28. Other?

Section V. PARTS REQUEST SLIPS

29. Is required information shown?

30. Are slips neat and legible?

★31. Is the duplicate returned to the repairman or records clerk with suspense number entered?

32. Other?



INDEX

	Paragraph	Page		Paragraph	Page
Accessory replacement and retirement schedule	7-8	7-8	Control, span of	4-1b	4-1
Accident reporting and investigation	10-1c	10-1	Crew chief method	5-3d	5-4
Aircraft:			Damage, negligible	5-9	5-7
Daily status report	7-7	7-5	Deferred maintenance	5-9	5-7
Inspection and maintenance record (DA Form 2408-13) ..	3-5m	3-4	Delegation of authority	4-1d	4-2
Inspections	5-7	5-5	Depot maintenance	2-5b(4)	2-3
Inventory Record (DA Form 2408-17)	3-5q	3-5	Direct support maintenance	2-5b(2)	2-3
Maintenance status log	7-10	7-8	Dock method	5-3b	5-3
Maintenance training	6-1, 6-2	6-1	Employment in combat	5-15	5-10
Preventive maintenance indicators	11-6	11-2	Equipment:		
Servicing, safety precautions ..	10-4	10-4	Acceptance and Registration		
Status chart	7-6	7-5	Record (DA Form 2408-8) ..	3-5k	3-4
Air items, classification and definition	8-3	8-1	Categories of serviceability ..	3-3a	3-2
Appendixes, publications	7-2e	7-2	Evaluation of serviceability ..	3-3a	3-2
Arctic conditions, maintenance under	9-3	9-2	Inspection and Maintenance Worksheet (DA Form 2404) ..	3-5b	3-4
Army Aircraft Inventory, Status, and Flying Time (DA Form 1352)	3-3b	3-2	Inspection List (DA Form 2408-18) ..	3-5r	3-5
Army Aviator's Flight Record (DA Form 2408-12)	3-5l	3-4	Log Assembly (Records) (DA Form 2408)	3-5g	3-4
Army Field Stock Control System (AFSCS)	8-5	8-2	Log book binder	3-5f	3-4
Assignment, homogeneous	4-1c	4-1	Maintenance log (Consolidated) (DA Form 2409)	3-5s	3-5
Authority delegation of	4-1d	4-2	Maintenance of	2-1b	2-1
Avionics equipment, preventive maintenance indicators	11-6b	11-2	Maintenance Record (DA Form 2408-3)	3-3d	3-3
Camouflage	5-18	5-11	Manuals	7-3a(1)	7-3
Categories of maintenance	2-5	2-2	Modification Record (DA Form 2408-5)	3-5i	3-4
Changes, publications	7-2f	7-2	Record procedures	3-4, 3-5	3-3, 3-4
Charts:			Return of	8-17	8-7
Accessory replacement and retirement schedule	7-8	7-8	Serviceability criteria	3-3a	3-2
Aircraft status	7-6	7-5	Transfer Report (DA Form 2408-7)	3-5j	3-4
Combat readiness	2-2b	2-2	Exchange Tag (DA Form 2402) ..	3-5a	3-4
Command maintenance inspection ..	11-8	11-4	Federal stock number (FSN)	8-4	8-2
Command, unity of	4-1a	4-1	Federal supply classification (FSC) ..	8-4	8-2
Commercial technical publications ..	7-4b	7-5	Field service representative	5-11c(2)	5-8
Component changes	5-7b	5-6	Files, publications	7-2	7-1
Component Installation and Removal Record (DA Form 2408-16) ..	3-5p	3-5	Formal flight supplements	7-4a(2)	7-4
Component Removal and Repair/Overhaul Record (DA Form 2410)	3-5t	3-5	Fuel handling, safety precautions ..	10-4	10-4
			General support maintenance	2-5b(3)	2-3
			High altitude conditions, maintenance under	9-4	9-4
			Historical Record for Aircraft (DA Form 2408-15)	3-5o	3-5
			Homogeneous assignment	4-1c	4-1
			Hurricanes, precautions	9-6	9-5

	Paragraph	Page		Paragraph	Page
Indexes, publications-----	7-2b	7-2	System -----	2-1—2-5	2-1
Indicators, preventive maintenance	11-6	11-2	Training standards -----	6-2e	6-3
Information system, maintenance management -----	3-3	3-2	Under combat and other conditions -----	5-14—5-20	5-10
Inspect and repair only as needed (IROAN) -----	2-4g, 5-8	2-2	Unscheduled -----	5-10	5-7
Inspections -----	5-7a, 7-2d, 11-7, 11-8 (app. III)	7-2, 11-4 AIII-1	Management, maintenance. (See Maintenance Management.)		
Inspector, technical -----	11-9, 11-10	11-4	Materiel readiness:		
Interim flight supplements -----	7-4a(2)	7-4	Definition -----	2-2a	2-1
Jungle conditions, maintenance under -----	9-2	9-1	Objective -----	2-2b	2-1
Levels of managements:			Report (DA Form 2406) -----	3-3e	3-3
Field commands -----	3-2b	2-3	Responsibilities -----	2-2c	2-2
National agencies -----	3-2c	3-2	Military occupational specialties (MOS)		
Operational units -----	3-2a	3-1	Awarding a higher -----	4-7	4-5
Lowering skill character -----	4-10	4-6	Proficiency requirements -----	4-4	4-3
Maintenance:			Secondary -----	4-8	4-6
Abuses and faulty practices --	11-2	11-1	Skill character:		
Allocation chart (MAC) -----	5-6	5-5	Awarding a -----	4-9	4-6
Arctic -----	9-3	9-2	Lowering a -----	4-10	4-6
Categories -----	2-5b	2-2	Skill levels -----	4-5	4-5
Coordination -----	5-11	5-7	Withdrawing -----	4-11	4-6
Deferred -----	5-9	5-7	Modification work orders (MWO) --	7-3c	7-3
Desert -----	9-1	9-1	Mooring -----	9-1	9-5
During a move -----	5-19	5-11	Mountain conditions, maintenance in	9-4	9-4
Equipment -----	2-1b	2-1	Negligible damage -----	5-9	5-7
Jungle -----	9-2	9-1	Night Maintenance -----	5-20	5-11
Management:			Normal action MWO's -----	7-3c(2)	7-4
Fundamentals and functions of -----	4-1—4-3	4-1	Objectives, maintenance -----	2-3	2-2
Information system -----	3-3	3-1	On-the-job training (OJT) -----	6-2b	6-2
Levels of -----	3-2	3-1	Organization, principles of -----	4-1	4-1
Purpose of -----	3-1a	3-1	Personnel:		
Requirements for -----	3-1b	3-1	Obligations of -----	4-3b	4-2
Methods of performing -----	5-3	5-3	Relations -----	4-3	4-2
Mountain or high altitude conditions -----	9-4	9-4	Use of -----	4-3c	4-3
Night -----	5-20	5-11	Prescribed load list (PLL) -----	8-8, 8-15b	8-3, 8-6
Objectives -----	2-3	2-2	Preventive maintenance -----	5-6, 11-4, 11-6	5-5 11-1—11-2
Operation technical inspection guide ----- (app. III)	AIII-1		Principles of maintenance -----	2-4	2-2
Organizing to perform -----	5-1—5-4	5-1	Production line method -----	5-3c	5-3
Preventive. (See preventive maintenance.)			Proficiency pay test requirements --	4-6	4-5
Principles -----	2-4	2-2	Proficiency requirements, MOS --	4-4	4-3
References for planning -----	5-13	5-9	Progressive method -----	5-3e	5-4
Request and Continuation Sheet (DA Forms 2407 and 2407-1) -----	3-5e	3-4	Publications:		
Request Register (DA Form 2405) -----	3-5c	3-4	Appendixes -----	7-2e	7-2
Responsibilities -----	2-5	2-2	Changes -----	7-2f	7-2
Salt air conditions -----	9-5	9-4	Disposition of -----	7-2h	7-2
Scheduling -----	5-5—5-13	5-5	Files -----	7-2	7-1
Specialist -----	5-11c(1)	5-8	Indexes -----	7-2b	7-2
Supervisors -----	4-1—4-3, 10-3, 11-6	4-1, 10-1, 11-2	Preventive maintenance indicators -----	11-6e	11-3
			Supplementary type -----	7-4	7-4
			Technical -----	7-3	7-3
			Readiness, materiel. (See Materiel readiness.)		
			Readiness, unit -----	3-3c	3-3

	Paragraph	Page
Record of Demands (DA Form 2527) -----	8-10b(2), 8-1b, 8-12	8-4, 8-5
Records and forms -----	3-5	3-4
References -----	app. I)	AI-1
Repair parts:		
Forecast of abnormal requirements -----	8-13	8-6
Issue and turn-in -----	8-16a	8-6
Preventive maintenance indicators -----	11-6f	11-3
Records -----	8-10	8-4
Revision of quantities -----	8-12	8-5
Stockage -----	8-11	8-5
Storage -----	8-15	8-6
Report, daily aircraft status -----	7-7	7-5
Request for Issue and Turn-In (Manual) (DA Form 2765-1) --	8-9b	8-4
Request for Issue or Turn-In (Mechanical) (DA Form 2765) --	8-9a	8-4
Requesting -----	8-5c, 8-6, (app. III)	8-3, AIII-1
Requirements, proficiency pay test	4-6	4-6
Responsibilities:		
Commander -----	2-2c	2-2
Maintenance -----	2-5	2-2
Safety:		
Consideration -----	10-3	10-1
Education -----	10-1b	10-1
Of flight -----	7-4a	7-5
Prevention of accidents -----	10-2	10-1
Program -----	10-1a	10-1
Salt air conditions, maintenance in -----	9-5	9-5
Sand and dust conditions, maintenance under -----	9-1a	9-1
Secondary MOS -----	4-8	4-6
Service platoon -----	5-2	5-1
Service school training -----	6-2a	6-1
Skill character:		
Awarding a -----	4-9	4-6
Lowering a -----	4-10	4-6
Span of control -----	4-1b	4-1
Spot Check inspections -----	11-8	11-4

	Paragraph	Page
Standing operating procedures (SOP):		
Sample guide ----- (app. II)		AII-1
Unit-type -----	5-4	5-4
Supply:		
Bulletins -----	7-3e	7-4
Federal classification (FSC) --	8-4	8-2
Manuals -----	7-3d	7-4
Source of -----	8-7	8-3
System, maintenance -----	2-1-2-5	2-1
Technical:		
Assistance program -----	5-11c	5-8
Bulletin compliance record ---	7-9	7-8
Bulletins -----	7-3b	7-3
Manuals (TM) -----	7-2g, 7-3a	7-2, 7-3
Supply, unit -----	8-1, 8-2	8-1
Title Insert (Informal Accountability) (DA Form 1543) -----	8-10b(1), 8-15b	8-4, 8-6
Tools:		
Common deficiencies -----	8-16b(3)	8-7
Method of accounting for ---	8-16b	8-7
PM indicators -----	11-6c	11-3
Safety practices -----	10-3b(1)	10-2
Storage -----	8-15d	8-6
Unserviceable or broken ---	8-16b(2)	8-7
Training:		
Aircraft maintenance -----	6-1, 6-2	6-1
Instructor's -----	6-2g	6-4
Standards, maintenance -----	6-2e	6-3
Suggestions -----	6-2f	6-3
Uncorrected Fault Record (DA Form 2408-14) -----	3-5n	3-5
Unit readiness -----	3-3c	3-3
Unit-type SOP -----	5-4	5-4
Unity of command -----	4-1a	4-1
Unscheduled maintenance -----	5-10	5-7
Unserviceable materiel, disposition of -----	2-4d, 8-17b	2-2, 8-8
Urgent action MWO's -----	7-3c(1)	7-3
Use of personnel -----	4-3c	4-3
Weight and balance -----	5-12	5-8
Withdrawing an MOS -----	4-11	4-6



By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

J. C. LAMBERT,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

ACSFOR (2)
ACSI (5)
CORC (2)
CNGB (2)
USABAAR (1)
USAMB (5)
USAAVNTB (5)
USCONARC (10)
USACDC (2)
USAAVCOM (75)
ARADCOM (1)
ARADCOM Rgn (1)
OS Maj Comd (10)
MDW (1)
Armies(10)
Corps (3)
Div (5)
Div Arty (3)
Bde (2)
Regt/Gp (1)
Bn (2) except
 Avn Bn (5)
Avn Co (3)
Avn Btry (3)
FA Btry (1)
USAAVNHRU (2)
USACGSC (10)
USATC (3)
Br Svc Sch (5) except
 USATSCH (10)
USASWS (5)

USAARMS (10)
USAES (20)
USAAMS (7)
USAIS (10)
USAATC (3)
Units org under fol TOE:
5-36 (2)
5-52 (2)
6-302 (2)
6-401 (2)
6-416 (2)
6-426 (2)
6-436 (2)
6-466 (2)
6-517 (2)
6-576 (2)
7-42 (2)
17-42 (2)
17-52 (2)
17-56 (2)
17-58 (2)
17-108 (2)
37-42 (2)
44-2 (2)
51-1 (2)
51-2 (2)
55-56 (2)
55-58 (2)
55-457 (2)
55-458 (2)
55-550 (AA-AE) (2)

NG: State AG (3); Units—Same as Active Army except allowance is one copy to each unit.

USAR: Units—same as Active Army.

For explanation of abbreviations used, see AR 320-50.



11
12
13



14
15
16



S/S

Pages



*He
Page*

S/S ch 2

*FM 1-10

FIELD MANUAL }
No. 1-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 20 September 1965

ARMY AVIATION ORGANIZATIONAL AIRCRAFT MAINTENANCE

	Paragraph	Page
CHAPTER 1. PURPOSE AND SCOPE.....	1-1, 1-2	1-1
2. THE MAINTENANCE SYSTEM.....	2-1 to 2-5	2-1, 2-2
3. MAINTENANCE MANAGEMENT AND EQUIPMENT RECORD PROCEDURES		
Section I. Maintenance management.....	3-1 to 3-3	3-1, 3-2
II. Equipment record procedures.....	3-4, 3-5	3-3, 3-4
CHAPTER 4. CONTROL AND SUPERVISION OF MAINTENANCE		
Section I. Fundamentals and functions of management.....	4-1 to 4-3	4-1
II. MOS structure.....	4-4 to 4-11	4-3
CHAPTER 5. ORGANIZATIONAL MAINTENANCE OPERATIONS		
Section I. Organizing to perform maintenance.....	5-1 to 5-4	5-1
II. Maintenance scheduling.....	5-5 to 5-13	5-5
III. Maintenance under combat and other conditions.....	5-14 to 5-20	5-10
CHAPTER 6. AIRCRAFT MAINTENANCE TRAINING	6-1, 6-2	6-1
CHAPTER 7. PUBLICATIONS AND CHARTS		
Section I. Publications.....	7-1 to 7-4	7-1
II. Charts.....	7-5 to 7-10	7-5
CHAPTER 8. AVIATION TECHNICAL SUPPLY		
Section I. General.....	8-1 to 8-7	8-1
II. Repair parts procedures.....	8-8 to 8-13	8-3
III. Storage and issue turn-in procedures.....	8-14 to 8-17	8-6
CHAPTER 9. MAINTENANCE OF ARMY AIRCRAFT UNDER EXTREME WEATHER CONDITIONS.....	9-1 to 9-7	9-1 to 9-5
10. GROUND SAFETY IN MAINTENANCE WORK.....	10-1 to 10-4	10-1 to 10-4
11. QUALITY CONTROL		
Section I. Maintenance standards.....	11-1 to 11-6	11-1 to 11-2
II. Technical inspections.....	11-7 to 11-10	11-4
APPENDIX I. REFERENCES.....		AI-1
II. SAMPLE GUIDE: MAINTENANCE AND TECHNICAL SUPPLY STANDING OPERATING PROCEDURES.....		AII-1
III. INSPECTION GUIDES FOR ORGANIZATIONAL MAINTENANCE AND TECHNICAL SUPPLY.....		AIII-1
INDEX.....		I-1

*This manual supersedes FM 1-10, 17 August 1960, including C 1, 16 April 1962, and TM 1-320, 25 July 1963.



CHAPTER 1

PURPOSE AND SCOPE

1-1. Purpose

a. This manual provides basic information on principles, concepts, and techniques of organizational aircraft maintenance and technical supply. It furnishes guidelines for commanders, staff officers, and organizational maintenance and supply supervisors in management, supervision, and in scheduling of aircraft maintenance.

b. Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to the Commandant, United States Army Aviation School, Fort Rucker, Ala. 36362.

1-2. Scope

a. This manual furnishes detailed information on—

- (1) The organizational maintenance system.

- (2) Categories of aircraft maintenance and technical supply.
- (3) Establishment and operation of an organizational maintenance activity in the field, under combat conditions, or in a counterinsurgency operational environment.
- (4) Maintenance management to include supervision, shop operations, publications, scheduling, and duties of maintenance and supply personnel.
- (5) Quality control through standards of maintenance and technical inspections.
- (6) Aviation technical supply operations—requisitioning and storage procedures.
- (7) Safety precautions to be taken in the maintenance and servicing of Army aircraft.
- (8) Maintenance of Army aircraft under extreme weather conditions.

b. The material presented herein is applicable without modification to both nuclear and nonnuclear warfare, and to counterinsurgency operations.



CHAPTER 2

THE MAINTENANCE SYSTEM

2-1. General

a. The objectives and concepts of maintenance, definition of the Army maintenance system, policies governing the conduct of maintenance operations, and the responsibilities for the maintenance of equipment adopted for Army use are covered in detail in AR's 750-1 and 750-5.

b. Maintenance of equipment includes all the work required to—

- (1) Prevent its breakdown or deterioration.
- (2) Restore it to serviceable condition.
- (3) Determine its disposition when uneconomically repairable.
- (4) Determine requirements for its evacuation when unserviceable.
- (5) Provide repair parts support.

2-2. Materiel Readiness (AR 11-14)

a. *Definition.* Materiel readiness is the condition of materiel in every Army organization (measured for quality, quantity, and serviceability) which permits the prompt and economical fulfillment of assigned tasks. It includes—

- (1) Determining the status of equipment in relation to standards established for specific end items and organizational materiel.
- (2) Correcting and reporting factors which contribute to deficiencies of equipment such as manpower shortages; lack of funds; improper training; failure to conserve equipment life; shortages of repair parts, tools, and facilities; and poor maintenance management.

b. *Objective.* The Army's highest priority peacetime function is to attain and maintain a combat operational status sufficient for units to accomplish their assigned missions in ac-

cordance with the time schedule established in operation and contingency plans. Combat readiness requires both ready personnel and ready materiel. Materiel or equipment maintenance is one of the most critical and complex problems of the Army. A prime Army mission is to have forces with an early deployment capability ranging from a few hours to a few days. That capability demands a constant state of materiel readiness in balance with personnel readiness consistent with the mission of each unit.

c. *Responsibilities.* Commanders, soldiers, and civilians at all levels should realize the importance of maintaining materiel in a ready condition. This is an Army-wide, worldwide problem involving all officers, warrant officers, enlisted personnel, and civilians. A proper priority application of available resources is required so that funds, manpower, management, and technical skills are applied to improve materiel readiness. Organizational maintenance units have the responsibility for achieving the desired standards of aircraft availability. Commanders at all levels should take the following action:

- (1) Designate a materiel readiness officer.
- (2) Instruct each individual on his mandatory obligation to maintain his equipment in the assigned state of readiness.
- (3) Provide adequate time for the performance of preventive maintenance. *Materiel readiness must be considered equal to that of personnel training and readiness.*
- (4) Insure prompt repair of equipment deficiencies.
- (5) Consider placing certain items in storage when resources necessary to maintain the required state of readiness are not available.
- (6) Conduct sufficient command inspec-

tions to determine the actual condition of each unit's equipment.

- (7) Reflect the actual condition of equipment in Materiel Readiness and Operational Readiness reports.

2-3. Objectives of Maintenance

The objectives of maintenance are to—

- a. Assist in assuring the capability of Army units to accomplish assigned missions.
- b. Predict, prevent, detect, isolate, and correct incipient failures by preventive maintenance services and inspections.
- c. Keep all types of equipment ready for their intended use.
- d. Minimize requirements for replacement equipment.
- e. Insure the maximum economical service life of all Army equipment.
- f. Be immediately responsive to, and be prepared to support, increased requirements of supported units occasioned by increases in operational activity.
- g. Return required unserviceable, economically repairable equipment to a serviceable condition with minimum expenditure of men, money, and material.

2-4. Principles of Maintenance

- a. Each commander is responsible for his assigned maintenance.
- b. Maintenance will be performed in accordance with published maintenance doctrine at the lowest category consistent with the tactical situation, skills, time, repair parts, tools, and test equipment available.
- c. Repairs will be accomplished on site, whenever feasible, and in accordance with maintenance allocation charts.
- d. Unserviceable materiel, the repair of which is beyond the maintenance capability of an organization, will be reported, delivered, or evacuated to the next higher maintenance organization.
- e. Whenever possible, all authorized maintenance within the capability of an organization will be accomplished before evacuation of economical repairable items to the next higher maintenance organization. Higher categories

will perform the maintenance functions of lower categories when required or directed by appropriate commander.

f. As a source of repair parts and assemblies, controlled cannibalization, as prescribed in AR's 750-50 and 750-1500-8, may be used to support maintenance of equipment.

g. Repairs will be accomplished under the "inspect and repair only as needed" (IROAN) principle at organizational and direct support levels of command. General support and depot maintenance will be accomplished to permit return of an item to the supply system in accordance with maintenance standards established for each item of equipment (AR 750-5).

2-5. Categories of Maintenance

Maintenance responsibilities are assigned to specific levels of command in accordance with the primary mission characteristics, mobility of the level involved, and the economical distribution of resources.

a. The maintenance system is divided into four mutually supporting categories in order to—

- (1) Relate maintenance to other military operations.
 - (2) Provide organizations for maintenance operations in the field.
 - (3) Facilitate the assignment of maintenance missions and responsibilities to specific levels of command.
 - (4) Permit the orderly and efficient distribution of available maintenance resources.
- b. The four categories of maintenance are—
- (1) *Organizational*. Organizational maintenance is that maintenance normally authorized for, performed by, and the responsibility of a using organization on equipment in its possession. This maintenance consists of functions and repairs within the capabilities of authorized personnel, skills, tools, and test equipment as prescribed in appropriate Department of the Army TOE's or TD's. Maintenance exceeding the authorized scope may be performed when authorized by the next higher maintenance support commanders.

form standards for all units in the active Army. It requires an overall evaluation of personnel, training, and logistics for each combat unit and combat support unit. The unit equipment profile (UEP) is combined with supply, training, and personnel status. This combination results in a definite expression of the unit's combat readiness that can be compared with the operational mission of the unit. The readiness report is based on the following categories of information:

- (1) *Readiness requirement (REDCAT)*. The level of readiness assigned in peacetime to each unit of a command as required by that command to accomplish its assigned missions in relation to the deployment schedule of the unit.
- (2) *Readiness capability (REDCAPE)*. The level of readiness assigned each unit which is within the capability of the major Army command to support with programed and/or allocated resources.
- (3) *Readiness condition (REDCON)*. The actual level of readiness of a unit.

★*d. Equipment Maintenance Record* (DA Form 2408-3). DA Form 2408-3 provides a record of maintenance services, inspections, and repairs requiring parts usage at the organizational level. It also provides a method of recording and reporting status of equipment availability and serviceability and is a source document for the collection of maintenance engineering data. This

form will be closed out at the end of each calendar quarter. The national maintenance point copy (copy 3) for all items listed in appendix III, TM 38-750, will be forwarded to the appropriate addressee. Prior to submitting this form the unit must perform an equipment serviceability criteria evaluation. The findings of this evaluation will be entered in block 14 and explained in block 12 if the serviceability of the item is red.

★*e. Materiel Readiness Report* (DA Form 2406). DA Form 2406 provides information on the readiness status of equipment in the hands of using organizations. This report will be prepared on a quarterly basis for selected items of equipment and copies will be sent in accordance with TM 38-750. Information in the report is designed to—

- (1) Provide commanders at lower levels with equipment status information for planning day to day operations.
- (2) Provide installation and organization commanders with information on maintenance backlogs, serviceability of equipment, density of equipment, and availability of equipment for operations.
- (3) Provide commanders with the materiel readiness status of equipment in using units.
- (4) Provide the desired condition of materiel readiness for designated items of equipment to the Department of the Army.

Section II. EQUIPMENT RECORD PROCEDURES

3-4. General

★TM 38-750 contains the Army equipment record procedures to be used for the control, operation, and maintenance of all Army equipment. It prescribes procedures for the use, preparation, and disposition of forms and records of the Department of the Army's integrated equipment record and maintenance management system. Proper use, preparation and submission of the forms covered in TM 38-750 by operational units is the key to the entire integrated system. These forms are used by the commander to check his operational status, trouble spots, and equipment use and performance. TM 38-750 prescribes the records which are required for each item of equipment and lists those forms and records which pro-

vide input to logistic management. The following is the scope of TM 38-750.

a. Application of the integrated system to Army equipment in support of effective materiel readiness.

★*b.* Mandatory equipment improvement reporting.

c. Recording and mandatory reporting of MWO (modification work order) requirements and accomplishments.

d. Correlation between equipment technical manuals and the integrated system.

e. Recording essential information to be used for evaluation of materiel readiness as prescribed by maintenance management procedures (TM 38-750-1).

f. Engineering data for design of new equipment, redesign of standard equipment, and product improvement.

3-5. Forms and Records

The following forms and records are used by organizational aircraft maintenance units. Instructions for their use, preparation, and disposition are contained in TM 38-750.

a. *DA Form 2402, Exchange Tag*. This form will be used to identify unserviceable parts being exchanged, repaired, or held as an EIR exhibit.

b. *DA Form 2404, Equipment Inspection and Maintenance Worksheet*. The DA Form 2404 provides a standard procedure for recording—

- (1) Equipment faults found as a result of inspection, by maintenance activities, diagnostic checkouts, and spot check inspection of equipment.
- ★(2) The results of command maintenance management inspection (CMMI), when desired as a worksheet only.
- (3) The results of equipment serviceability criteria tests and checks prescribed by AR 750-10.

c. *DA Form 2405, Maintenance Request Register*. This is an internal shop management record which provides a record of maintenance requests (DA Form 2407) and component removal and repair/overhaul records (DA Form 2410) processed within a maintenance activity.

d. *DA Form 2406, Materiel Readiness Report*. For an explanation of this form, see paragraph 3-3e.

e. *DA Form 2407, Maintenance Request and DA Form 2407-1, Continuation Sheet*. These forms are used at organizational level to—

- (1) Request maintenance services.
- (2) Report accomplishment of modification work orders.
- ★(3) Submit equipment improvement report (EIR).
- ★(4) Report receipt of defective materiel, except items damaged in shipment.

f. *Equipment Logbook Binder (FSN 7510-889-3494)*. The equipment logbook binder will contain those forms prescribed for each item of equipment and will remain with the equipment to which it pertains.

g. *DA Form 2408, Equipment Log Assembly*

(*Records*). This form is a permanent part of the logbook and is used to provide a ready reference to assembly instructions and symbols to be used in equipment logs.

h. *DA Form 2408-3, Equipment Maintenance Record (Organizational)*. For an explanation of this form, see paragraph 3-3d.

★i. *DA Form 2408-5, Equipment Modifications Record*. This form is used to record the requirements for an application of all authorized modification.

j. *DA Form 2408-7, Equipment Transfer Report*. The transfer report provides a record of transfer of items on which a historical record is mandatory, and for which maintenance data is to be collected as indicated in TM 38-750.

★k. *DA Form 2408-8, Equipment Acceptance and Registration Record*. This form is strictly informational at user level. It is used to record the status of the equipment when it is received from the manufacturer, and provides a record of overhaul and rebuild on equipment while in the Army inventory that results in a change of the federal stock number.

l. *DA Form 2408-12, Army Aviator's Flight Record*. This form is used to record actual aircraft time and duty and type of flight performed by the aviator and crew.

m. *DA Form 2408-13, Aircraft Inspection and Maintenance Record*. This form is used to—

- (1) Record detected faults and the action taken to correct them.
- (2) Maintain a continuing record of aircraft flying hours.
- (3) Record maintenance and servicing performed.
- (4) Indicate when scheduled maintenance inspections come due.
- (5) Indicate status of the aircraft and of installed mission essential equipment.

n. *DA Form 2408-14, Uncorrected Fault Record*. This form is used to record uncorrected faults to include overdue replacement of components, and the reason therefor.

o. *DA Form 2408-15, Historical Record for Aircraft*. The historical record is used to record significant historical data for an aircraft while it is in the Army inventory.

p. *DA Form 2408-16, Component Installation and Removal Record*. This form is used as a per-

manent record of time change components and selected condition items that are installed or have been removed from an aircraft.

★*g. DA Form 2408-17, Aircraft Inventory Record.* This form provides an accurate and exact checklist of property assigned to the aircraft which is subject to periodic inventory.

★*r. DA Form 2408-18, Equipment Inspection List.* This form is used to maintain a list of inspections accomplished at intervals which are not related to airframe operating time or aircraft inspection intervals. This form is also used to record directed interim recurring inspections until

these inspections are incorporated in the applicable -20 technical manual.

★*s. DA Form 2409, Equipment Maintenance Log (Consolidated).* This form is used as a separate equipment log and provides a complete maintenance history of an item of equipment.

★*t. DA Form 2410, Component Removal and Repair/Overhaul Record.* This form provides a record and report for the control of all aircraft engines and specific aircraft components. It will be prepared for all time change components and selected condition items. See TB AVN 23-65 for condition items.



he must be aware of his obligations as an individual.

- (1) *Individual obligations.* The success of the mission is ultimately determined by the performance of each individual in the organization. Each must—
 - (a) Subordinate his personal desires to those best for the organization.
 - (b) Be loyal to superiors.
 - (c) Show initiative. Personal ideas should be submitted through a suggestion box or in conference with the supervisor.
 - (d) Work compatibly with associates. This includes respecting the rights of others, advising and helping associates, being honest, and avoiding jealousy.
- (2) *Supervisory obligations.* A supervisor must be able to think clearly and rapidly, talk convincingly, listen attentively, and discriminate between right and wrong conduct and good and poor work performance. Specific supervisory obligations include—
 - (a) Realizing that the organization is composed of a group of individuals, each wanting to be treated as an individual.
 - (b) Taking a personal interest in each man.
 - (c) Carefully considering job assignments and placements.
 - (d) Recognizing efficient performance. Publicly praising an individual for a job well-done stimulates good will and cooperation.
 - (e) Punishing the guilty, not the group.
 - (f) Developing initiative through the assignment of reasonable workloads, occasional projects to be worked out by individuals, and added authority.

c. Utilization of Personnel. The five basic methods of using manpower wisely are—

- (1) *Assigning the right man to the right job.* Personnel should be assigned the particular jobs they can do best consistent with their present level of training, then be further trained on the job.
- (2) *Increasing availability of manpower.* Manpower availability depends upon health, safety, and reduction in absenteeism.
 - (a) A clean, warm, dry, well-lighted working space should be provided.
 - (b) Ground safety rules, and safe practices and procedures must be enforced.
 - (c) Mechanics (military) must attend specified classes, drills, physical training activities, etc. Work should be scheduled so that these absences will not disrupt operations.
- (3) *Stimulating the will to work.* This can be accomplished by the supervisor's personal interest in the men, proper training and assignments, promotions, increased responsibilities, or written commendations.
- (4) *Increasing the ability to produce.* This is best accomplished through continuous training (on-the-job training if the man can produce while learning) and up-grade training (more responsible duties on larger and more complicated aircraft) for mechanics.
- (5) *Fully utilizing a man on essential tasks.* This is achieved by scheduling a full day's work for each man.

Section I. MOS STRUCTURE

4-4. MOS Proficiency Requirements

a. AR 600-200 lists the duties, skills, and knowledge required of each MOS for enlisted men in the aviation maintenance field. This regulation, used in conjunction with the unit TOE, TDA, will guide the maintenance supervisor in placing enlisted men in positions commensurate with their MOS numbers. Every effort should be made to use a man in his highest MOS.

b. Job titles, with MOS numbers and a brief explanation of the qualifications of the school-trained organizational mechanics, are listed below:

- (1) *Aircraft maintenance crewman (67-A10).* This crewman is trained on the basic aviation subjects and special crewman subjects, including the use of technical manuals, forms, and records; the fundamentals of construction and fune-

tion of aircraft components such as reciprocating and turbine power plants; and aircraft systems. He is qualified as a mechanic's helper and to perform operational duties required at Army airfields, such as fueling, servicing, guiding taxiing aircraft, ground handling and mooring, and fire and crash rescue.

- (2) *Single-engine observation-utility airplane mechanic (67B20)*. This mechanic is trained and qualified to perform all organizational maintenance on O-1 (Bird Dog) and U-6 (Beaver) airplanes. He is also qualified to serve as crew chief for either airplane.
- (3) *Single-engine light cargo airplane mechanic, U-1A (67C20)*. This mechanic is qualified to serve as a crew chief on the U-1A (Otter).
- (4) *Multi-engine command airplane mechanic (67G20)*. This mechanic is qualified to maintain the U-8 (Seminole).
- (5) *Multi-engine observation airplane mechanic (67H20)*. This mechanic is qualified to maintain the OV-1 (Mohawk); he has the secondary MOS of 67B20 and may have one or more of the other specialized airplane mechanics' MOS's (67C20 and/or 67G20).
- ★(6) *Single-engine single-rotor observation helicopter mechanic (67M20)*. This mechanic is trained and qualified to perform all organizational maintenance on OH-13 (Sioux) and OH-23 (Raven) helicopters. He is also qualified to serve as crew chief for either helicopter.
- ★(7) *Single-engine single-rotor turbine utility helicopter mechanic (67N20)*. This mechanic is qualified to serve as crew chief

for the UH-1 (Iroquois). The 67N20 mechanic is qualified through fourth echelon maintenance and may be assigned to user as well as support type units.

- ★(8) *Single-engine single-rotor utility/light transport helicopter mechanic (67P20)*. This mechanic is qualified to serve as crew chief and maintain the UH-19 (Chickasaw) and CH-34 (Choctaw) helicopters; he is also qualified in MOS 67M20, and may be further qualified in MOS 67N20.
- ★(9) *Single-engine tandem-rotor helicopter mechanic (67S20)*. This mechanic is qualified to serve as crew chief and maintain the CH-21 (Shawnee) helicopter; he has the secondary MOS of 67M20. He may also be qualified in one or more of the other helicopter MOS's (67N20 and/or 67P20).
- ★(10) *Multi-engine single-rotor helicopter mechanic (67T20)*. This mechanic is qualified to maintain the CH-37 (Mojave) helicopter. He will have a secondary MOS of 67M20, and either or both MOS's 67P20 and 67S20.
- ★(11) *Multi-engine tandem-rotor helicopter mechanic (67U20)*. This mechanic is qualified to serve as crew chief and maintain the CH-47 (Chinook) helicopter. He is qualified through fourth echelon maintenance.
- ★(12) *Airplane technical inspector (67F20) or helicopter technical inspector (67W20)*. The 67F20 is qualified to complete initial and final inspections of all airplanes, and will have secondary MOS's of 67D20 and 67K20. The 67W20 inspector is qualified to conduct initial and final inspection on

all helicopters and will have as secondary MOS's any or all of the following: 67Q20, 67S30, 67T30.

Note. The MOS's in (1) through (12) above are specialist MOS's; they progress from smaller, less complex aircraft to larger aircraft.

4-5. Skill Levels

Under the present aircraft maintenance MOS system, the third character of the MOS position indicates the type of aircraft on which the individual is qualified. The fourth character position identifies skill levels such as 1, apprentice; 2, journeyman or organizational maintenance; and 3, advanced journeyman or support maintenance. The skill level 4 indicates leader with detailed job knowledge. The skill level 5 identifies supervisor with broad general knowledge. The maintenance supervisor in the field and the commanding officer should make every effort to assure that the men holding various MOS skill levels in the unit are given ample opportunity to acquire the knowledge expected of the skill characters.

a. Single-Engine Airplane Maintenance Chief (67E40). This NCO must be qualified in troubleshooting techniques for single-engine airplanes, and in supply procedures; he must be able to plan, direct, and supervise organizational maintenance of single-engine airplanes and to direct and supervise activities of an airfield service section.

b. Single-Engine Airplane Maintenance Chief (67E40). This NCO, in addition to possessing all the qualification of the lesser skill characters, must be able to plan, coordinate, and supervise activities pertaining to the service platoon and independent maintenance units to which he is assigned.

c. Supervisor (67E50). This NCO is in the E-8 or E-9 enlisted grade and normally fills positions of significant responsibility and leadership such as first sergeant and sergeant major in companies, battalions, brigades, and other appropriate organizations. The 67E50 is used as an example and may be found in any of the aircraft identification areas to include 67E50, 67L50, 67R50, 67S50, 67T50, and 67U50.

d. Aircraft Repair Chief (67Z40 and 67Z50). This enlisted position represents supervisors and chiefs who are qualified in both rotary wing and fixed wing aircraft.

4-6. Proficiency Pay Test Requirements

a. Proficiency pay is awarded in accordance with AR 600-200 based on the results of the MOS evaluation test and the commander's evaluation report. The MOS evaluation tests consist of a number of questions for the specialist skills and for the NCO skill levels. For the specialist skill levels, the questions are in the technical subject matter area and deal only with the specific aircraft on which the mechanic is performing maintenance. The NCO skill-level test will contain, in addition to the technical questions, questions dealing with supervisory principles and practices and their application to NCO's. The character 4 and 5 tests will also include some questions on arithmetic reasoning and reading ability. The NCO test includes questions on all aircraft indicated by the MOS.

b. The 67E40 and 67E50 will be tested on the O-1, U-6, and U-1A airplanes. The 67L40 will be tested on the U-8, ^{and} OV-1, and CV-2. The C-1 67R40 and 67R50 must know the OH-13, OH-23, UH-1, UH-19, and CH-34. The 67S40 and 67S50 must only know the CH-21. The 67T40 and 67T50 will be tested on the CH-37 only and the 67U40 and 67U50 must know only the CH-47.

4-7. Awarding a Higher MOS

This award should not be made solely to commend a man for faithful work. Such action could prove detrimental to the mechanic if he cannot complete the proficiency pay test for his new MOS. In that case, he will be more valuable to the unit working in a position for which he has been trained. The award of a higher MOS in the field should be given careful consideration.

a. The enlisted mechanic can further his knowledge of aircraft maintenance and become qualified to maintain aircraft in other than his MOS skill level or category through on-the-job training, units, schools, or experience (AR 611-203). Mechanics being considered for

award of higher MOS skill levels should be tested on their ability to perform new MOS duties.

b. When the maintenance officer is convinced (after studying the duties, skills, and subject matter of a higher MOS in AR 611-201 and observing the mechanic's work) that a man has demonstrated his ability to perform in a higher MOS, he should take necessary steps through channels to recommend the mechanic for the higher MOS. DA Form 1049 should be prepared giving the man's name, rank, rating, service number, current MOS, the recommended new MOS, and the length of time he has worked in the higher position. This form should be signed by the supervisor and forwarded through the company commander to the personnel officer who maintains the mechanic's DA Form 20.

4-8. Secondary MOS

Whenever a mechanic is awarded a higher MOS, his previous MOS should be recorded as one of his secondary MOS's. This will prevent the loss to the maintenance system of the skill held in the secondary MOS (AR 600-200); skill held in the secondary MOS (AR 600-200); (CH-21) but is also qualified in the CH-13 and OH-23, he should be awarded a secondary MOS of 67M20. If he is also qualified in the UH-1, he should be awarded another secondary MOS of 67N20.

4-9. Awarding a Skill Character

a. The same procedure outlined in paragraph 4-7 is used to award or change a mechanic's skill-level (fourth character). This character indicates either the appropriate level of technical skill (specialist) or supervisory leadership ability (NCO) possessed by the holder of the MOS. Skill level will be awarded only to indicate the actual level of skill attained by the mechanic—not to reflect his pay grade or the skill-level character indicated on the TOE or TD.

b. A higher skill-level character may be awarded after satisfactory performance of duty in a position requiring the higher skill level. Any mechanic assigned to a lower level of skill than that indicated by his primary MOS

will retain the higher character as long as he remains qualified.

4-10. Lowering a Skill Character

A skill-level character may be lowered by the appropriate company or unit commander or supervisory staff officer when it is determined that he is not qualified at that skill level. The NCO status (skill levels 4 and 5) implies leadership qualities which may be nullified by disciplinary action. The skill-level characters which indicate NCO status may be withdrawn when the NCO status is withdrawn. The supervisor should read AR 600-200 with care before initiating any action along these lines.

4-11. Withdrawing an MOS

An MOS may be withdrawn (AR 600-200) because of—

a. Erroneous entry of an MOS on the soldier's qualification record.

b. Physical inability to perform the duties of the MOS.

c. Inefficiency in the performance of the duties of the MOS. Action to withdraw an MOS or lower a skill character because of inefficiency must be approved by the company commander and the mechanic concerned. If the mechanic's approval cannot be obtained, the case will be referred to a classification board consisting of three officers—the unit personnel officer or a personnel management officer, an officer representing the training or personnel section of the appointing authority, and an officer with knowledge of the technical requirements of the MOS. The appointing authority can approve or disapprove the findings of the board, terminate the proceeding, or order a rehearing of the case.

d. Disciplinary action. Normally withdrawal is not accomplished in this case because such action usually does not affect a soldier's qualifications or ability to perform in an MOS.

e. Obvious disuse or disinterest in secondary and additional MOS.

f. Lack of security clearance required in the performance of duties normally associated with the MOS.

g. Appointment as a noncommissioned officer or a specialist pay grade which is not commensurate with or authorized for previously held MOS.

h. Reduction in grade under the provisions of UCMJ or AR 600-200.

i. Failure to achieve an MOS qualification score of 70 or higher when tested in the MOS.



CHAPTER 5

ORGANIZATIONAL MAINTENANCE OPERATIONS

Section I. ORGANIZING TO PERFORM MAINTENANCE

5-1. General

a. Organizational maintenance is that maintenance which is performed by a using organization on its own equipment as authorized by the appropriate maintenance allocation chart. It mainly consists of preventive maintenance, to include—

- (1) Inspecting, cleaning, servicing, preserving, lubricating, and adjusting, as required.
- (2) Replacement of minor parts not requiring highly technical skills.
- (3) Computing, requesting, and storing the prescribed load of spare parts.

b. Organizational maintenance is usually performed by the mechanics of the service platoon or other maintenance sections, assisted by the assigned crew chiefs. Normally, the crew chief will perform all organizational maintenance on his aircraft which is within his capability and which can be accomplished with his own tools. When the maintenance required exceeds his ability, or requires additional skills or tools, this maintenance will be performed by the service platoon or higher maintenance units.

★*c.* Work performed by the mechanics and crew chiefs must be closely coordinated to insure that effective and efficient organizational maintenance is performed. Requirements for special tools and equipment are directly related to the type and number of aircraft maintained by the unit, and to the category of maintenance performed. Authority for organizational tools and equipment is contained in the -20P (organizational maintenance repair parts and special tools list) for each type of aircraft or engine. Each unit is required to have the authorized special tools and equipment, and the prescribed load of parts at all times.

5-2. The Service Platoon or Maintenance Sections

a. Mission.

- (1) The service platoon or maintenance sec-

tions (hereafter referred to as service platoon) normally provides organizational maintenance for organic aircraft and wheeled vehicles, communications and sensor equipment, aircraft parts resupply, refueling service, and limited armament kit maintenance. The mission of the platoon may vary, depending on the type of unit and the equipment maintained.

- (2) Specific duties of the platoon which are directly related to aircraft maintenance and supply include—

- (a) Performing organizational aircraft maintenance for the company, assisted by the crew chief of the specific aircraft.
- (b) Requesting and stocking aircraft repair parts, tools, and related supplies.
- (c) Performing aircraft technical inspections and insuring quality control in all maintenance performed.
- (d) Assisting in the performance of scheduled inspections of the assigned aircraft.
- (e) Performing aircraft refueling, servicing, and crash rescue operations at the company airfield.
- (f) Preparing job requests for support maintenance and insuring that organizational deficiencies are corrected before aircraft are released to support units.
- (g) Receiving aircraft from support maintenance after checking the forms and records, the work performed, and the completeness of accompanying equipment.

b. Organization. The service platoon is usually located at the company airfield near the company headquarters. It normally consists of a platoon headquarters, an aircraft maintenance section, a communications maintenance section, and an airfield service section.

(1) *Platoon headquarters.* The platoon headquarters contains the aircraft maintenance office, the wheeled vehicle maintenance section, and the aviation technical supply area.

(a) *The aircraft maintenance office.* The maintenance office is normally located in a tent, a maintenance hangar, or a shop van. The physical layout is determined by the mission and facilities of the particular maintenance organization. To facilitate aircraft maintenance, necessary records, files, technical manuals, and other pertinent material are filed in this office. These serve as a ready reference for officers, inspectors, supervisors, mechanics, and clerks in planning and scheduling duties and workload, and in evaluating work already performed. A complete technical reference file on all aircraft on which the unit may perform maintenance is located in this area, and is available to supplement the records which accompany each aircraft. A specific place must be provided where these references may be studied. Personnel located in this office are the platoon leader, who is also the aircraft maintenance officer; the platoon sergeant; the technical inspectors; and the shop clerk.

(b) *Wheeled vehicle maintenance section.* It provides organizational maintenance for organic wheeled vehicles. It will normally be located in the same general area of the company headquarters. The tactical situation will dictate the degree of dispersion required. Personnel assigned to this section include a motor sergeant, wheeled vehicle mechanics, and helpers.

(c) *The aviation technical supply area.*

This area includes the office of the technical supply officer (additional duty), and the parts and equipment storage area and issue point. It should be located close to the aircraft maintenance area so it will be readily accessible to the aircraft mechanics. It is desirable to have the spare parts and tools in the hangar where the maintenance is performed; however, they may be located in adjacent buildings, tents, or shop vans, if available. In no case should its location create a hardship on the mechanics and require excessive travel time to and from the area.

(2) *Aircraft maintenance section.* The aircraft maintenance section is located in the area which will be the most desirable for conducting maintenance. This may be a hangar, tent, or other suitable shelter, or may be out in the open if no shelter is available. It must be accessible to all types of aircraft maintained by the service platoon, and must have a parking and runup area closely available. Organizational maintenance repairs and inspections beyond the capability of the crew chief will be performed in this area. The aircraft maintenance technician, assisted by the maintenance supervisor, controls the operation on this section.

(3) *Communications maintenance section.* The communications maintenance section consists of the communications chief and sufficient communications repairmen to perform the organizational maintenance on all communications equipment assigned to the company. This section should be located near the aircraft maintenance section so that communications equipment inspections and repairs may be accomplished at the same time that organizational maintenance is being per-

formed on the aircraft.

- (4) *Airfield service section.* The airfield service section consists of an airfield service chief and personnel to provide crash and rescue service, refueling service, parking and mooring service, and general assistance to aircraft using the airfield. A truck equipped with firefighting and rescue equipment and an FM radio is on continuous standby in the vicinity of the control tower. When this vehicle is dispatched from the airfield for crash and rescue purposes, it is augmented by a detail from other sections of the company. The airfield service section is equipped with fuel servicing trucks for servicing aircraft on the Army airfield. A $\frac{3}{4}$ -ton truck is required to transport, install, and maintain a field lighting set. Additional personnel to assist the airfield service section may be detailed from other elements of the company when required.

5-3. Methods of Performing Maintenance

a. General. There are several methods of performing maintenance on assigned aircraft. Each unit should select the method or combination of methods best suited for its requirements. Factors to be considered in selecting a maintenance system include—

- (1) Size and mission of the maintenance organization.
- (2) Type and number of aircraft to be maintained.
- (3) Flying schedule.
- (4) Skill and experience of available personnel.
- (5) Available hangar and equipment facilities.
- (6) Climatic conditions.

b. Dock. The dock method is a system by which inspections are made and maintenance of aircraft is accomplished at fixed docks equipped with workstands and testing apparatus. Specially trained crews move from dock to dock on a time schedule basis to accomplish their specific missions. When uncowed and cleaned, the aircraft is moved to the fixed location where it remains until inspection is completed. The dock method is designed to—

- (1) Utilize inexperienced personnel to the best advantage while developing their skill through a progressive on-the-job training program.
- (2) Reduce the number of men necessary to maintain any given number of aircraft.
- (3) Reduce the amount of equipment necessary for maintenance, and to fully utilize available equipment.
- (4) Improve the condition of the aircraft through frequent maintenance and standardized inspections.

c. Production Line.

- (1) *Description.* The production line method of maintenance is different from the dock method, in that the aircraft instead of the crews move from station to station. As the aircraft arrives at each station, specialists assigned to the station perform their specific checks and repairs in an allotted time. When the allotted time has elapsed, the aircraft is moved to the next station. If the work has not been completed, a "pad" crew (experts on maintenance performed at all stations) finishes the work at the succeeding station.

(2) *Considerations.*

- (a) *Breakdown of operations.* Logically, a mechanic should be assigned work on stations that are closely related and located in one area of the aircraft. Inspection and maintenance guides are valuable aids to job breakdown.
- (b) *Estimate of time per operation.* After observing the time spent on each operation, an estimate of the time required is made.
- (c) *Sequence of operations.* The maintenance and the inspections are divided so that one does not interfere with the other.
- (d) *Assignment of personnel to crews.* Personnel are distributed so that all operations can be completed within the same time interval.

d. Crew Chief.

- (1) *Description.* The crew chief method of maintenance uses the crew chief as the specialist on his aircraft. He must be thoroughly familiar with the aircraft and with the status of maintenance. This method is most practical in small units. The crew chief is assisted in the inspection and repair of his aircraft by the assigned mechanics.
- (2) *Inspections.* When an inspection is due, the aircraft will be brought to the service platoon maintenance area. An inspection crew made up of mechanics from the service platoon will be assigned to help the crew chief perform the inspection. The crew chief has first hand knowledge of the aircraft and existing faults. This close contact with, and thorough knowledge of the aircraft enables the crew chief, assisted by the inspection crew to complete a thorough inspection in a minimum amount of time. The aircraft may be located in any desirable location and may be moved if required.

Note. This method is most often used at the organizational level.

e. Progressive.

- (1) *Description.* Progressive maintenance is that method in which scheduled maintenance is performed between scheduled flights, thereby increasing aircraft availability.
- (2) *Considerations.*
 - (a) The inspection worksheets or cards must be grouped into stations on the aircraft so that once the cowling is raised on an aircraft for inspection, all necessary tests and inspections for that requirement will be performed in progressive sequence.
 - (b) Whenever the aircraft is on the ground for even an hour, the crew chief or mechanic must have necessary inspection workcards available, and should perform whatever maintenance is possible at the particular station in the time allowed. When necessary maintenance has been

completed, cards are initialed and aircraft time entered in the appropriate places by the crew chief or mechanic.

- (c) The progressive maintenance program will be closely supervised so that all components or parts of the aircraft are inspected within the prescribed time limit.
- (d) A red dash will be entered in the "status today" column during inspection; the column for aviator's and mechanic's remarks will explain that the inspection is in progress.
- (e) When an inspection requires the disassembly of a component, it should be done as rapidly as possible during a time when the flight schedule for the aircraft permits.
- (f) Maintenance accomplished on each aircraft must be accurately recorded to insure that no inspection phase has been omitted.

5-4. A Unit-Type SOP

a. A *standing operating procedure* (SOP) is a set of instructions for a particular unit describing routine operational features, both tactical and administrative. SOP's reduce the number and length of orders that must be issued. For sample outline, see appendix II.

b. Standing operating procedures for service platoons are designed to—

- (1) Simplify the preparation and transmission of orders.
- (2) Simplify and perfect unit training.
- (3) Promote understanding and teamwork between the commander, staff, troops, and other units.
- (4) Facilitate and expedite operations, and minimize confusion and errors.

c. SOP's are printed in the most effective and convenient form and are changed when necessary. They may be issued as a single pamphlet; as several pamphlets, each pertaining to a separate operation; or in looseleaf form. A service platoon SOP should contain information on—

- (1) Maintenance operations.
- (2) Liaison with field maintenance.

- (3) Aircraft and vehicle accidents.
- (4) High wind and storm procedure.
- (5) Evacuation plan.
- (6) Inspections.
- (7) Reports and records.

- (8) POL procedures.
- (9) Requesting procedures.
- (10) Issue and turn-in procedures.
- (11) Shop and line safety.
- (12) Other subjects as required.

Section II. MAINTENANCE SCHEDULING

5-5. General

Maintenance scheduling, which is the responsibility of the unit maintenance officer, is necessary for high maintenance standards and efficient flight scheduling. It becomes more important when experienced maintenance personnel or facilities are limited. Administrative planning, if conducted properly, improves maintenance.

a. The basic requirement for scheduling aircraft maintenance is to control overall aircraft flying time so that the scheduled maintenance on aircraft is completed with as few aircraft grounded as possible.

b. Mutual coordination between the operations officer and the maintenance officer must be effected on a continual basis, so as to provide the number of aircraft needed to meet mission requirements and to simultaneously permit adequate time for maintenance.

5-6. Preventive Maintenance

Preventive maintenance is the first priority of organizational maintenance units. Replacement of parts and assemblies and minor repair, as authorized by the pertinent maintenance allocation chart (MAC), will be the prime mission.

a. To perform his job well and to obtain a high aircraft availability, the organizational maintenance officer should insure that aircraft not flying are undergoing maintenance. This requires close supervision.

- (1) When the aircraft is shut down, it should be serviced immediately for fuel and oil.
- (2) The crew chief will check the pilot's remarks on DA Form 2408-13 for any faults found during flight, and will correct them on the spot if practicable.

(3) If a fault is not shown from the aircraft's last flight, the DA Form 2408-14 will be checked to see if a delayed fault can be corrected during the down-time available.

(4) A technical supply check will be conducted to determine the status of parts on request.

b. If faults which can be corrected are not found on the DA Forms 2408-13 and 2408-14, the crew chief or mechanic should use available time to visually inspect those parts of the aircraft likely to cause trouble. Faults are determined from aircraft maintenance experience, based upon a knowledge of the existing mission, terrain, and climatic conditions. Careful inspection of the aircraft at every opportunity simplifies preventive maintenance.

c. During downtime, the crew chief or mechanic should check to determine when the next scheduled periodic inspection is due. If the periodic inspection is due within 2 or 3 hours, phases of the inspection that do not require teardown of a component may be completed. The aircraft, however, should remain available for flight on short notice.

5-7. Inspection⁵ and Component Changes

a. Inspections.

- (1) TB AVN 23-67 prescribes the authorized inspection procedures to be used by individuals and activities operating and maintaining Department of the Army aircraft. It contains a brief description of each type inspection and prescribes the intervals at which they will be performed. These intervals should not be exceeded. Under unusual conditions of environment, utilization, mission, etc., the maintenance officer will increase the scope and/or the frequency of inspections. The

maintenance officer is not authorized to increase the interval between inspections nor decrease their scope, except under emergency conditions.

- (2) The aircraft inspection requirements appear as inspection checklists in the -20 PMD, PMI, and PMP for each type aircraft. These TM's contain detailed inspection checklists for preventive maintenance daily, preventive maintenance intermediate, and preventive maintenance periodic inspections. Special inspections are contained in the -20. They do not contain instructions for repair, adjustment, etc. These instructions are found in the -20 (organizational aircraft maintenance manual). Each item is numbered in accordance with the area sequence method; the inspection should be performed in accordance with this method. This allows maintenance personnel to completely inspect all items within a given area before moving to another area, thus permitting a thorough and progressive inspection around the aircraft.
- (3) An effective inspection system is based on staggering aircraft time in order to maintain a reasonable number of aircraft available for missions at all times. In order to accomplish this and to perform all maintenance inspections at the prescribed time, the maintenance officer must be familiar with the inspection status of each aircraft and know the hours which can be flown before the next inspection is due. There are many methods which can be used to make this information available to the maintenance officer. Some units post this information on aircraft status charts or locally produced forms, while others construct bar graphs which compare the times on all of the aircraft assigned to the unit. Any method is satisfactory which meets the needs of the unit and enables the maintenance officer to achieve a workable system of inspections.

b. Component Changes.

- (1) When planning the scheduling of accessory replacements, TB AVN 23-10 should be consulted.
- (2) If the component is to be changed by the support maintenance activity, the unit supervisor must coordinate with support maintenance to insure that the parts to be changed will be on hand when the aircraft is scheduled, and that sufficient time is allowed for support maintenance to prepare for the job. By scheduling the aircraft to support maintenance so that, within safety limits, maximum component operating time can be realized, the unit is practicing economy of supply and helping to raise the operating time limit of the component (as determined by study of the service life of repair parts by higher levels).
- (3) Time or calendar-change components must be ordered in advance of their scheduled replacement date if they are to be available when the change is due. On those items not in the "critical items" list, a stated amount of time freedom (TB AVN 23-10) is allowed for changing the components. Parts not ordinarily stocked should generally be ordered 45 days in advance of need. The average amount of flying time per day for the aircraft involved will largely determine (by converting the aircraft flying-hour-remainder into days) when the parts should be ordered.

5-8. Inspection and Repair Only as Needed (IROAN)

IROAN is that maintenance technique which determines the minimum repair necessary to restore equipment, components, or assemblies to prescribed maintenance serviceability standards by using all available diagnostic equipment and test procedures, and by minimizing disassembly and parts replacement. *IROAN* is applicable to all categories of maintenance. *IROAN* principles are outlined in AR 750-5. Aircraft requiring extensive maintenance are

nominated on a condition basis by the commanders for input to depot maintenance. Once nominated, the aircraft is given a thorough inspection by support maintenance personnel and a report is submitted to the U.S. Army Aviation Materiel Command (USAAVCOM) giving all pertinent information relative to aircraft condition and work requirements. Based on analysis of this report, the aircraft is scheduled into the appropriate maintenance facility for repair. Transfer of accountability to USAAVCOM normally will occur on aircraft undergoing extensive depot repair.

5-9. Deferred Maintenance (Negligible Damage)

a. In the past, numerous cracks, dents, scratches, or wrinkles in the aircraft skin or component parts have either been repaired or parts removed which could have been considered as *negligible damage* and continued in service. Small dents and wrinkles noted during inspection will be written up on the DA Form 2408-13 as faults, and may be transferred to the DA Form 2408-14 and corrected at the next scheduled inspection.

b. *Negligible damage* is damage or distortion which may be permitted to exist or may be corrected by simple procedures. This may include removing dents, stopdrilling cracks, or temporarily patching, without placing a restriction on flight.

- (1) Negligible damage is considered deferred maintenance and is a responsibility of organizational maintenance.
- (2) If feasible, negligible damage will be deferred until the time or scheduled maintenance.

c. To insure flight safety, care must be exercised in classifying any damage as negligible. Deep skin wrinkles of undetermined origin are not classified as negligible until the source of the damage has been determined. A minute inspection must be made to ascertain any possible damage to adjacent areas. Abnormal stresses incurred by shock or impact forces may be transmitted to the extremity of the structural members, resulting in secondary damage such as sheared or stretched rivets. Points of attachment must be examined for distortion and security of fastenings in primary and secondary damage areas.

d. No fault suspected as a safety of flight factor will be considered deferred maintenance (TM 38-750). Since the dividing line between a red diagonal and a red X condition is often indistinct, the maintenance officer must exercise caution. He must ground the aircraft if there is a reasonable doubt of flight safety. This doubt may include the inability to obtain prompt enough advice from a higher category of maintenance. *Any* fault that *could* become dangerous by continued use will be considered a red X condition.

5-10. Unscheduled Maintenance

a. Unscheduled maintenance is that maintenance which cannot be predicted. Unexpected aircraft difficulties or emergencies may occur which require prompt correction. Immediate action technical compliances may be received which will ground all aircraft of a particular type until complied with.

b. If a needed part is not in stock or cannot be obtained through exchange in a short time, and if the mission justifies, the part can be removed from a nonflyable aircraft to make another aircraft flyable (AR 750-1500-8). In the field or in combat, when supply lines are temporarily out of commission or supplies are delayed en route, the ingenuity of maintenance personnel should be used to increase the availability of aircraft.

c. If the unit receives an order to move on short notice, the maintenance officer or the unit commander must evaluate the condition of the aircraft and insure that they will not be left for salvage. An aircraft can be in a red X condition and still be safe for a *one-time flight*.

5-11. Maintenance Coordination

a. *Coordination With Operations.* By keeping himself well informed of the inspection status of the assigned aircraft, the maintenance officer can foresee the probability of major inspections coming due for two or more aircraft at or near the same time. In order to prevent this, he must maintain close contact and coordination with the unit operations officer. The maintenance officer should furnish operations with continuous reports on aircraft status, availability, and hours to major inspections. Based

on this information, the operations officer should coordinate flight scheduling with the maintenance officer in order to meet the operational requirements of the unit and provide adequate time for the accomplishment of organizational maintenance. A proper working relationship between the two should enable both of them to accomplish their mission without undue strain on either section, and increase the overall efficiency of the unit. Lack of cooperation can create an increased workload for the maintenance section and lower the aircraft availability to an unacceptable level.

b. Coordination With Support Maintenance. Close cooperation between organizational and support maintenance units will alleviate many difficulties between them and effect a smooth, well organized maintenance operation. Organizational units can expedite this maintenance operation by correct preparation of maintenance requests and completion of all organizational maintenance before evacuating an aircraft to support maintenance installations. The aviation unit commander and the commander of the supporting aircraft maintenance company plan jointly in determining requirements for aircraft maintenance and supply support, and in establishing insofar as possible, a mutually acceptable schedule of aircraft into the support activity. Subsequently, should either commander foresee a possible deviation from the established plan, he should immediately advise the other, and the two commanders should coordinate in making necessary adjustments. Such planning—

- (1) Enable^s the aviation unit commander to better plan and manage his organizational maintenance.
- (2) Enable^s the supporting unit commander to plan and manage the support workload, to anticipate repair parts requirements, and to make timely requests for assistance when needed.
- (3) Contributes to more rapid repair and return of equipment to the user.
- (4) Enables the aviation unit commander to more accurately predict the availability of operational aircraft that can be sustained over a given period of time.

c. The Technical Assistance Program. Technical assistance in the maintenance support of Army aircraft may be requested by commanders under the provisions of AR 750-5. The purpose of the program (AR 750-22) is to provide maintenance advice, assistance, training guidance, and instruction for equipment operation and maintenance and to provide feedback of equipment performance data. The personnel involved are employed by the commodity commands of the Army Materiel Command.

(1) *Maintenance specialists and commodity command personnel.*

(a) *Maintenance specialists.* These are either military or Department of the Army civilians, who are technically qualified to provide installation, operation, and operation "know how" on particular categories or items of equipment.

(b) *Commodity command personnel.*

1. *Manufacturer's representative.* A manufacturer's representative is an employee of an industrial or commercial company who is specially trained in the installation, operation, and maintenance of an item of equipment or system manufactured by his company.

2. *Field technicians.* Field technicians represent the Government as advisors on the installation, operation, and maintenance of equipment, not necessarily the product of one manufacturer.

3. *Technical instructor.* These instructors teach installation, operation, or maintenance of equipment used or supported by the Department of the Army.

(2) *Field service representative.* A field service representative is an employee of a manufacturing or commercial company who provides both company administration for technical services personnel and liaison between his company and the U. S. Army at no direct expense to the Department of the Army.

5-12. Weight and Balance

a. General. Weight and balance becomes in-

creasingly important as aircraft load capacity is increased. Many aircraft accident investigations have revealed inaccurate use of ~~complete~~ ^{ignorance} of weight and balance data by operating personnel. Support maintenance is responsible for weighing Army aircraft; the unit commanding officer, maintenance officer, and the individual Army aviator are responsible for the maintenance and computation of weight and balance data in accordance with AR 95-16.

b. Unit Responsibility for Weight and Balance Data. The maintenance officer should schedule his maintenance in such a manner that the aircraft in his organization come due for weighing at spaced intervals rather than all at once. He should strive to have the weighing accomplished when the specific aircraft is undergoing scheduled support maintenance work. Although weighing the aircraft is a support maintenance mission, the organizational mechanics must be aware of the changes that are recorded when the basic weight of the aircraft changes. Basic records that must be changed or checked before and/or after weighing the aircraft are the DD Form 365 (Record of Weight and Balance Personnel), DD Form 365A (Chart A—Basic Weight Checklist), DD Form 365B (Airplane Weighing Record), DD Form 365C (Chart C—Basic Weight and Balance Record), and DD Form 365F (Weight and Balance Clearance Form F). For instructions in filling out these forms, see TM 55-405-9.

c. Support Maintenance Responsibility. Duties and responsibilities of support maintenance activities relative to weight and balance are outlined in AR 95-16. These duties and responsibilities include—

- (1) Weighing *each* class II aircraft under the jurisdiction of support maintenance activities at *least* once a year, or more frequently if necessary, to insure that the weight and balance data for the individual aircraft is accurate.
- (2) Weighing *one* representative aircraft of each type of class I aircraft under their jurisdiction at *least* once a year, or more frequently if necessary, to insure that the weight and balance data

is accurate, and that the loadings usually employed are satisfactory for safe flight.

- (3) Having the aircraft weighing equipment tested for accuracy at required intervals.
- (4) When equipment and personnel are not available to the support maintenance activity, arranging to have aircraft weighed by depot maintenance facilities, by other Department of Defense services on a cross-service basis, or by contractual agreement.
- (5) Inspecting all class II aircraft under their jurisdiction for proper station markings.

5-13. Planning Factors

Planning factors for maintenance scheduling, flying hours, aircraft capabilities, and accessory replacement can be found in supply bulletins, special regulations, field manuals, and technical bulletins, as indicated below.

a. Supply Bulletin 1-1. SB 1-1 (Army Aircraft Flying Hour Factors and Forecast), as modified periodically by DA letters, provides annual program factors and data for all Department of the Army personnel concerned with supply, maintenance, procurement, inventories, distribution, provisioning, budgeting, and operation of Army aircraft and allied equipment. It establishes planned annual Army aircraft flying hours (for programing depot, support, and organizational maintenance) and gives a basis for evaluating actual hours performed. Periodic DA letters redefine the program base for developing annual flying hour factors for each type, model, and series of aircraft.

b. Field Manual 101-10. FM 101-10 (Staff Officer's Field Manual: Organizational, Technical and Logistical Data—Part I, Unclassified Data) is a planning guide and provides planning data for staff officers of all echelons. It provides the commander with general planning factors for the Army aircraft in his command; it lists characteristics of Army aircraft and gives planning factors for figuring the availability of aircraft, requirements for landing sites, and loading and unloading times.

c. *TB AVN 23-10*. *TB AVN 23-10* establishes procedures within the Department of the Army for the replacement and reuse of aircraft accessories with the general principle of *maximum utilization of aeronautical accessories in*

consonance with the economic operation of the aircraft. The bulletin takes flight safety into account and is an important aid to the maintenance supervisor who is scheduling the replacement of component parts of an aircraft.

Section III. MAINTENANCE UNDER COMBAT AND OTHER CONDITIONS

5-14. General

C-1 The mission of the Army, as a part of the Armed Forces of the United States, is to provide the security of the United States and for the support of its national and international policies. To accomplish this mission, the Army must be ready, at all times, to undertake land combat operations and sustain them indefinitely. Tactical training under simulated combat conditions will insure that aircraft maintenance personnel are prepared to operate efficiently under actual combat conditions. Only the highest standards of maintenance are acceptable in combat; close supervision in training is necessary to insure that proper habits and high standards will be carried by individuals into later situations. Counterinsurgency operations are in an environment which appears peaceful on the surface, particularly in seemingly secure airfields, metropolitan military installations, and supply points. Such appearances tend to lull combat service support personnel into a false sense of security. The fact is, there are no secure areas.

5-15. Employment

In combat, to include counterinsurgency operations, the service platoon should be employed in a manner which will enable it to keep the maximum number of aircraft flyable at all times. This will require that maintenance personnel be capable of performing the required maintenance during darkness, adverse weather conditions, and during actual combat.

a. *Principles of Employment.*

- (1) The service platoon normally is employed under centralized control of the maintenance officer.
- (2) Organic special tools and ground-handling equipment for aircraft maintenance normally are pooled at the service platoon and delivered to satellite airfields as required.

- (3) To insure adequate maintenance operation and support, the maintenance officer or assistant maintenance officer uses an aircraft for liaison with the flight platoons operating from the satellite airfields.

- (4) Urgently needed aircraft parts and supplies are transported to the satellite airfields by the best available mode of transportation.

b. *Factors Affecting Employment.* The typical service platoon of the aviation company is organized and equipped to perform organizational maintenance in the field, with supporting maintenance accomplished by *Transportation Aircraft Maintenance Companies* (DS or GS). Factors which affect the employment of these units include the—

- (1) *Distance of flight platoons from the aviation company airfield.* The maintenance officer must maintain close contact with flight platoons operating independently or from distant airfields if he is to program maintenance requirements wisely.
- (2) *Ability of flight platoons to perform necessary maintenance.* When maintenance requirements of the flight platoons cannot be met with available tools, either the aircraft must be flown to the service platoon area for the maintenance or the necessary tools, equipment, and specialists must be flown to the flight platoons. Although greatest efficiency is obtained by centralized maintenance operations, a supply of special tools and ground-handling equipment should, when practicable, be added to the maintenance capability of platoons operating independently or from satellite airfields.

CHAPTER 6

AIRCRAFT MAINTENANCE TRAINING

6-1. General

The aircraft maintenance officer is responsible for the instruction and training of personnel in maintenance and repair of Army aircraft. As the complexity of aircraft and components increases, the required skill of the mechanic must also increase. Therefore, training becomes more important with each new item of equipment introduced into the system. Because of the technical nature of aircraft maintenance training, it is desirable for all aircraft mechanics to be service school trained. However, school training does not reduce the need for training in the unit. Maintenance training must be a continuous process. The individual must be further trained in his primary MOS while being cross-trained in other skills and MOS's; e.g., cross-training of aircraft maintenance personnel in supply procedures promotes greater understanding and efficiency, and creates a reserve of personnel in the supply field. Objectives, responsibilities, and concepts of military training are covered in FM 21-5.

6-2. Methods of Training

The two primary methods of training aircraft mechanics are *service school training* and *on-the-job training*.

a. *Service School Training.* The most effective method of training aviation mechanics is through formal courses of instruction taught in the Army school system. DA Pam 20-21 contains general information on the school training program of the Army, an alphabetical list of all courses, and detailed information concerning each course. It also shows the location of each training agency, and includes information on available housing and messing facilities and other information concerning the training agencies.

- (1) *Selection of individuals for service school training.*

- (a) AR 611-215 governs the classification and selection of active service enlisted personnel for training at Army service schools. Quotas are issued to appropriate commands by the Department of the Army, either by allocation letters or by periodic quota circulars. Requests for additional quotas may be submitted to Department of the Army in accordance with AR 350-22. Units should take full advantage of their school quotas so they can have a ready source of expertly trained replacements for critical specialist positions.

- (b) Knowledge, craftsmanship, and integrity are the characteristics of a good aviation mechanic. Moral prerequisites for an individual going into aircraft maintenance training are that he conscientiously apply his skills to each job; that he adhere to prescribed methods, procedures, and techniques; and that he perform his duties with a sense of responsibility to himself, his fellow workers, and his country.

- (2) *Training for entry MOS 67A10.* The individual must meet the prerequisites set forth in DA Pam 20-21. He must also meet the minimum service requirements, in months, as set forth in AR 600-200. To keep the promotion ladder open for men who have the necessary time in grade and experience in various MOS levels, E-6's and above should not be selected to attend the basic entry course. The logical selection is the E-5 or below who has the necessary mental and mechanical ability and a desire to enter the aviation maintenance field.

(3) *Training in advanced MOS's.* The soldier selected to attend an advanced MOS school must be a qualified maintenance crewman (MOS 67A10) through training at an accredited service school or by having demonstrated his ability and knowledge of the MOS as a result of civilian or on-the-job training. The soldier who has an advanced MOS (e.g., 67N20) and desires to further his training in aviation maintenance is a good prospect for attending other advanced MOS courses, if quotas are available and if the organization needs the particular type training. DA Pam 20-21 lists the prerequisites for qualification. The supervisor must determine if the soldier has enough service time remaining after completion of the course to comply with the regulation. The unit should select only the most deserving and best all-around mechanics for service school training.

b. On-the-Job Training (OJT). *On-the-job training* is training received during the actual performance of duty. It is an integrated portion of the unit training phase. It may be used to qualify an individual for a given MOS when service school training is not possible, or to increase his proficiency in an MOS in which he is already qualified. The trainee must spend a portion of his time in a productive capacity on the job. The best technique is to group experienced, preferably school trained specialists, with individuals with less training and experience. Thus, the lesser trained mechanic learns from an experienced specialist and then applies what he has learned, thereby gaining valuable practical experience. In conducting an OJT program, the following must be considered:

- (1) Aviation maintenance training is a continuing necessity and OJT is always required.
- (2) Training is the responsibility of the supervisor, the trainee, and the entire unit.
- (3) The unit mission is paramount.

- (4) A training program must include an instructor and a trainee.
- (5) A successful training program must be flexible. It may be necessary to use a combination of training methods, depending on the subject, time available, and the capabilities of the trainee.

c. Methods. The following training methods are basic to a well-planned training program:

- (1) *Direct supervision (apprentice or coach-pupil method).* Coach-pupil instruction is one of the best methods of OJT and is the quickest way to fit a trainee into the operation of a unit. Without specific direction and guidance in learning to perform duties, a new trainee is likely to waste time and material and form poor work habits. An experienced mechanic is able to teach a trainee timesaving shortcuts, the value of using a torque wrench, that safety is everybody's business, that TM's are invaluable guides in performing maintenance, etc.
- (2) *Self-study.* Skilled duties like those in aviation maintenance require considerable job knowledge and judgment. Even simple jobs involve a great deal of basic job information that the mechanic must acquire. Training given through direct supervision is seldom complete within itself in developing basic mechanics into skilled, advanced specialists. Formal technical training courses should be utilized to the fullest extent. Mechanics who come to the organization with a fair technical background and some experience can acquire, through study of pertinent technical publications, much of the knowledge needed in the MOS skill for which they are striving.
- (3) *Group instruction.* Group instruction is a practical adjunct to direct supervision and self-study. This method is not to be confused with classroom or academic-type instruction. While academic-type instruction will hinder production, group instruction which is intelligently handled can improve pro-

duction. *For example:* If six trainees are learning the same process and four of them have difficulty with a portion which the other two perform well, the four having trouble can work with the other two and, usually in a short time, resolve the difficulty. Other advantages of this instructional method are that it—

- (a) Is a timesaver when several trainees are to be instructed in the same job method or procedure.
- (b) Provides opportunity for open discussions and group problem solving.
- (c) Develops judgment.
- (d) Provides time to motivate the trainees.
- (e) Leads to cooperation among the trainees.
- (f) Allows the supervisor or trainer to check progress and to clarify matters which are difficult for the trainee to understand.

d. Implementation. When implementing OJT, the supervisor must—

- (1) Determine the exact need for training, by establishing the specific job requirements and the individual skills of the trainee. When these two factors are known, this formula may be used: the specific job requirements minus the individual skills of the trainee equals the on-the-job training required.
- (2) Determine the method or methods of training which will be most effective. The number of people, time available, facilities required, nature of training, and individual capabilities are factors which will affect this decision.
- (3) Select the people who will conduct the training, remembering that the success of the program depends on those who conduct it.
- (4) Procure training aids and handouts applicable to the program.
- (5) Survey unit assignments to assure that each assignment fits the individual's classification, skills, and background.
- (6) Insure that the program is active, that

training records are kept current, and that newly developed skills are being used.

e. Maintenance Training Standards. Any OJT program for a prospective maintenance crewman or for a specialist studying for a higher and more complex MOS or skill-digit level, must be complete and comprehensive enough to meet the standards of instruction maintained at the service school. These standards can be maintained by coordination with the service school and by the use of master lesson plans prepared for MOS training.

- (1) *Coordination with service school responsible for MOS training.* Coordination with the service school can be accomplished by personal visit or by letter stating the purpose of the OJT program and requesting the school's program of instruction, the standards expected of a specialist in the particular MOS, and the process for examining the trainee after instruction.

- (2) *Use of master lesson plans.* The master lesson plans available at the service school responsible for the MOS training are excellent for insuring that the standard of instruction will be on a level with that of the school. Although these master lesson plans are designed for academic presentation, the principles and standards set forth therein will aid the unit in its OJT program. The specialist trained on the job must compare favorably with the school-trained specialist, if unit time and effort are to be worthwhile and if the specialist is to be highly skilled.

f. Training Suggestions. In addition to the instructor's information in FM 21-6, the supervisor of OJT can improve the presentation and have a more successful program by—

- (1) Teaching the trainee pride in his work. The instructor's attitude is reflected in the trainee's performance. Hence, he should assure that every detail of the trainee's performance is of the highest standard. When practical, the trainee should be sent on

flights in the aircraft on which he performed maintenance.

- (2) Teaching the trainee what to look for. At first, the trainee may see only the most apparent faults when he inspects an aircraft or an engine. As his training progresses, he will see the missing safety, the broken tube, or the chafed conduit. The instructor should show and explain to the trainee the things to look for when inspecting.
- (3) Rotating the trainee. Rotation (cross-training) of the trainee on several phases of the MOS is a bonus to the supervisor who wants a good OJT program.
- (4) Giving the trainee definite reading assignments. Assignment of study material in technical manuals and other publications pertinent to the MOS specialty is an important aspect of teaching. The technical manuals on the aircraft associated with the MOS are excellent for helping the trainee learn the basic principles of the MOS.
- (5) Giving the trainee practice problems. During OJT the paperwork relative to the MOS specialty should be covered. The trainee is given problems in requisitioning a part and in completing forms and records; these projects help him understand approved working methods by practical exercises and by practice.
- (6) Making necessary changes in the program. As TM's, TB AVN's, and other publications change, the references used in the training program must be changed. The local situation, operational problems, and emergencies demand a flexible OJT program.

- (7) Measuring the trainee's progress. The trainee should be tested at the beginning of the course. His work papers should be collected, corrected, and saved. After a reasonable length of time, the same test questions should again be answered by the trainee, with the results compared. In this way, the trainee's progress can be recorded in a practical manner and his deficiencies noted for further training.

- (8) Keeping a checklist of the trainee's progress. A checklist should be kept to record the trainee's progress. It should be flexible enough to conform to the day-to-day operation, yet rigid enough to present a true picture of the trainee's progress. See figure 6-1 for an example of this type checklist.

g. Instructors. The job knowledge of the OJT instructor must be firm and practical—he must know the practical aspects of the subjects as well as the theoretical. Trainees respect a man who can *do* a job as well as talk about it. An instructor must have the ability to present the material to others; he must also be able to apply common sense to instructional problems. The principles outlined in FM 21-5 for the selection and training of instructors must be followed. Basic points to be considered when selecting instructor personnel are that—

- (1) Instructors be qualified mechanics or technicians and have at least 6 months experience.
- (2) Instructors receive refresher training.
- (3) Instructors receive special training in controlled observation (on-the-spot correction).
- (4) Instructors receive special training in conducting and scoring tests.

CHAPTER 7

PUBLICATIONS AND CHARTS

Section I. PUBLICATIONS

7-1. General

The organizational maintenance unit is responsible for obtaining and filing those publications which pertain to the administration and operation of the unit and its assigned equipment. Publications required to insure the safe operation and efficient maintenance of unit aircraft must be available and be kept current. Individuals assigned to the unit must be familiar with the publications system and must know how to use the appropriate publications in performing organization maintenance. They should be encouraged to rely on the information contained in the publications and to have the appropriate publications available at all times when working on aircraft. Army Regulations 310-1 and 310-3 cover military publications' general policies, preparation, coordination, and approval. They also contain a detailed explanation of the publications numbering system.

7-2. Publications Files

★*a. Procurement.* Publications files will be accessible to all personnel. The two methods for obtaining publications for unit files are *pinpoint distribution* and *formula distribution*. DA Pamphlet 310-10 provides a comprehensive guide for acquiring adequate publications.

- (1) *Pinpoint distribution.* Pinpoint distribution is a method of initial distribution and resupply of selected publications directly to Active Army and USAR units from a single Adjutant General Publications Center (AR 310-1). Requirements are submitted on the appropriate DA Form 12-series through channels to the appropriate center. DA Forms 12-4 and 12-9 are used by aviation maintenance units for pinpoint distribution of administrative publications. DA Forms 12-31 and 12-34 cover the majority of technical publications required for aircraft maintenance. The unit deter-

mines which publications are required to accomplish its mission and fills out the applicable DA Form 12. This form is sent to the battalion or next higher headquarters for approval and for mailing to the U.S. Army Publications Centers (Baltimore or St. Louis) for direct distribution to the unit. Each unit which has an account with a U.S. Army Publications Center will be assigned an account number which must appear on all forms. When publications requirements change, a revised DA Form 12 must be sent through channels to the appropriate center. Certain publications, such as AR's and circulars, will be sent to battalion or group and will be broken down for issue to the assigned units. In this case, the unit requirements are sent to the battalion on a DA Form 12 where they are consolidated.

- (2) *Formula distribution.* Formula distribution is a list of specific using organizations with an allowance for each (AR 310-1). The formula distribution information listed on the publication determines who will receive it. Requirements for publications receiving a formula-type distribution are computed on DA Forms 12-1, -2, and -3. Additional copies of publications, replacement publications, or those which are not included on automatic distribution may be requisitioned on a DA Form 17. This form is for a one-time issue and will not change the number or types of publications which will be received on pinpoint distribution.

★*b. Indexes.* Military publications indexes are contained in DA Pam 310-series and list all Department of the Army publications. Publications are listed in the indexes in the order shown on the front of the publication, in numerical order. An alphabetical listing by subject or item of equip-

ment is in the back of each index. Individuals must understand the index system and the use of the indexes in order to identify and locate publications. To find a particular publication, an individual should look up the subject in the back of the index and find the number of the publication containing information on the subject. He may then turn to the numerical listing and obtain the detailed information on the publication (title, date, number of changes, etc.). The indexes of primary interest to the organizational maintenance unit are—

- (1) DA Pam 310-1, Military Publications: Index of Administrative Publications.
- (2) DA Pam 310-2, Military Publications: Index of Blank Forms.
- (3) DA Pam 310-3, Military Publications: Index of Doctrinal, Training, and Organizational Publications.
- (4) DA Pam 310-4, Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals, Supply Bulletins, Lubrication Orders, and Modification Work Orders.

- ★(5) DA Pam 310-6, Military Publications: Index of supply catalogs and supply manuals.

c. Currency of Files. Files will be checked against appropriate indexes to insure that they are up to date. After a file is initially established, its current status will be checked against each applicable new numerical index, revision, or supplement received. Each active file will be checked annually against the appropriate numerical index to determine any deficiencies or excesses in the file.

d. Inspection of Files. Publication files will be inspected to insure that—

- (1) All publications required by using personnel are available.
- (2) Files are conveniently located to users.
- (3) Unnecessary publications are not in the file.

e. Appendices. An appendix is an addition to a publication and may include tables, charts, and supplementary information. It is an integral part of the publication, though not a part of the normal sequence of discussion. An appendix may be a part of the basic publication (e.g., an appendix of flight operating charts in a flight manual), or it may be issued separately to include additional information in an existing publication. Each separate appendix received will be filed at the end of the basic publication, which will be posted to show the addition.

★*f. Changes.* Department of the Army publications are maintained in current status by the publication of numbered changes or revisions. The first change issued is numbered C 1, the second C 2, etc., and later changes may supersede previous ones. As these changes become available, they are listed by change number, under the basic publication number and title, in the appropriate numerical index.

g. Technical Manuals for Aircraft Files. Each Department of the Army aircraft must have its individual publications file. AR 750-1500-2 lists those technical publications and forms which must be included in each file and contains instructions for their location and maintenance. Aircraft files will consist of those publications specified in AR 750-1500-2 and by current directives, plus others included by the maintenance officer, which are necessary for mission accomplishment. The maintenance officer must insure that maintenance personnel are aware of the location of the individual items included in the aircraft files and that they have access to them when required.

h. Disposition of Publications. Publications may be disposed of when they have been rescinded, replaced, superseded, or when they are no longer needed.

- (1) Unclassified publications will be disposed of as directed by the local salvage officer.
- (2) Classified publications will be destroyed in accordance with AR 380-5.

7-3. Technical Publications

★ Technical information on Army aircraft operation, maintenance, and supply is found in technical manuals, technical bulletins, modification work orders, supply manuals, and supply bulletins. These publications provide specific information on tools and repair parts allowances, operation, and maintenance and supply procedures for all aircraft.

a. *Technical Manuals (TM)*.

(1) *Definition*. Technical manuals are divided into two groups (AR 310-1).

(a) *Equipment manuals*. These manuals cover preparation for use, operation, maintenance, and overhaul instructions. In addition, they contain parts lists and related technical information.

(b) *Other manuals*. These manuals are prepared on a variety of subjects, other than equipment, which are considered necessary for training.

(2) *Numbering*. Equipment manuals will be numbered as follows:

(a) The designated number of the preparing technical service.

(b) A dash and four digits representing the Federal Supply Classification or class (SB 708-21) assigned to the equipment.

★(c) A dash and three digits beginning with 200. All parts of a technical manual on the same item of equipment will have the same number. Successive manuals in the same FSC group or class will be numbered 201, 202, etc.

(d) A dash and two digits indicating the category of maintenance to which the manual applies.

1. Operator's Instructions -10.

2. Organizational Maintenance Instructions -20.

★3. Direct Support Maintenance Instructions -30.

★4. General Support Maintenance Instructions -40.

5. Combination of categories. Support and depot combined would be numbered -35.

★6. Depot Maintenance Instructions -50.

(e) A serial number of (/1, /2, etc.) when

a manual part or part combination is published in more than one manual.

(f) The suffix letter P for repair parts manuals.

(g) Manuals which prescribe equipment serviceability requirements will have -ESC immediately following the three digit item identification.

★(h) Preventive maintenance inspection checklist (daily, intermediate, periodic) will have either -20PMD, -20PMI, or -20PMP following the item identification.

Note. Other manuals are assigned a basic number indicating the subject matter to which the manual applies and a subnumber for further identification within its particular class.

★b. *Technical Bulletins (TB)*. Technical bulletins contain only technical information. They do not contain administrative material or material pertaining to tactical training or tactical operations. They may supplement TM's but will not make direct changes in the content of the manuals or be published in lieu of TM's. Technical bulletins applicable to aviation are prefixed by TB AVN. *Example*: TB AVN 7 covers the painting and marking of Army aircraft.

c. *Modification Work Orders (MWO)*. Modification work orders contain instructions for the alteration and modification of materiel. They require compliance within specified time limits and are grouped according to the importance and urgency of the instructions they contain. They furnish supplementary instructions and operating procedures and are the only authorized media to provide modification instructions for aircraft and equipment. Commanders will insure that operating personnel become familiar with the contents of these publications. The two types of MWO's are *Urgent Action* and *Normal Action* (AR 750-5).

(1) *Urgent Action*.

(a) Urgent Action MWO's are issued to correct dangerous or potentially hazardous conditions which could result in injury to personnel, damage to property, or unacceptable reduction in combat efficiency. Such risks are calculated to be tolerable only within

definite time limits as specified in (b) below.

- (b) These MWO's either ground the aircraft immediately or specify that the work is to be completed within dates specified on the MWO, usually not to exceed 10 days after receipt of the MWO. The first page is bordered in distinctive red symbols with URGENT ACTION printed at the top of the page.
 - (c) Appropriate form entries will be made in accordance with TM 38-750.
 - (d) If compliance is not accomplished within the time limit specified, the aircraft condition status symbol will be changed as directed on the first page of the MWO.
- (2) *Normal Action.*
- (a) Normal Action MWO's are issued when procedural faults are found which would prove hazardous through prolonged, continuous use. These faults may be of a material mechanical, operational, or tactical type; they involve risks which are considered tolerable within broad limits. In addition to being hazardous, faults of this type may reduce—
 - 1. Operational efficiency.
 - 2. Operational life or general service utilization.
 - 3. Tactical or tactical support usefulness.
 - (b) Normal Action MWO's are printed on plain white paper without border symbols and are issued without recision dates. Each MWO will state who will accomplish the work, when it will be accomplished, instructions to be followed in the event it is not accomplished, by the specified time, the form entries required, the stocks affected, and the aircraft affected.

★*d. Supply Catalogs and Manuals (SM).* Supply manuals contain item identification and operational information required by supply and related activities. They include the following: Federal stock numbers, Federal item names and description, units of issue, expendability, parts allowances and stockage data, cross references, and other essential supply information. Current listing of supply catalogs and supply manuals is found in DA Pam 310-6.

e. Supply Bulletins (SB). Supply bulletins contain information on the more technical aspects of supply matters, such as compiled logistical data, etc. They do not contain administrative supply instructions. Information pertaining to aviation supply may be found in the SB -1 or SB 55-series bulletins.

7-4. Supplementary Type Publications

a. Safety of Flight Supplements.

- (1) *General.* Safety of flight supplements are issued to give prompt safety of flight information. They contain important informational, operational, precautionary, and restrictive instructions that affect safety of flight but do not require grounding of the aircraft. When safety of flight information is applicable to more than one type of aircraft, separate supplements are issued for each type of aircraft involved.
- (2) *Types.* These supplements are issued in two forms—*interim* and *formal*.
 - (a) *Interim supplements.* Interim supplements are issued by teletype message when loss of life or serious injury to personnel may be involved.
 - (b) *Formal supplements.* Formal supplements are printed and distributed through normal channels when serious damage to the aircraft is involved, or to replace interim supplements.

DISPOSITION FORM						SECURITY CLASSIFICATION (IF ANY)			
FILE NO.			SUBJECT						
			COMMANDER'S DAILY AIRCRAFT STATUS REPORT						
TO			FROM				DATE/TIME		
LINE E	TYPE ACFT A	ACFT SER.NO. B	ACFT STATUS C	HRS.TO PMI INSP. D	HRS.TO PMP INSP. E	GROUNDED DATE & LOCATION F G		EXPECT RELEASE DATE H	REMARKS I
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Figure 7-2. Commander's daily aircraft status report.

pertinent remarks. It may be written on a piece of plain paper or may be stenciled on a standard disposition form (fig. 7-2). The aircraft type and serial number may be included on the stencil. This report is valuable in the coordination between the maintenance officer and the operations officer. By using this form, the operations officer can schedule the aircraft to allow for equal distribution of flying hours and aid the maintenance officer in scheduling the maintenance so that the minimum number of aircraft will be down for maintenance at any one time. This form should be prepared daily and sent to the operations officer before he schedules the aircraft for the following day's flights.

7-8. Accessory Replacement and Retirement Schedule

Accessory replacements should be ordered far enough in advance to insure that they will be on hand when needed. An accessory replacement and retirement schedule (chart) (fig. 7-3) lists the aircraft, the accessories listed in the appropriate -20 TM, and the hours accessories are due for replacement or retirement. During the PE just prior to the one when replacement is to be made, a parts request is submitted to technical supply and the replacement time on the chart is circled (indicating that the part has been requested). When the part is received, another circle will be added making a double circle around the time. This time will remain circled until the replacement has been accomplished; then the new replacement time will be entered in this block.

7-9. Modification Work Order and Technical Bulletin Compliance Record

a. A consolidated MWO/TB compliance record, showing those MWO's/TB's which have not been fully complied with, may be maintained in the maintenance office of all maintenance units. This record may be kept on charts, Kardex files, cards, or any other form from

which commanders can readily determine the status of each assigned aircraft for MWO/TB noncompliance.

b. The consolidated record will contain the following information:

- (1) Type, model, and serial number of all assigned aircraft.
- (2) All applicable MWO's/TB's not fully complied with.
- (3) Status of compliance for those MWO's/TB's not complied with, including the number, date of issue, expiration date, and request number of the MWO/TB kit.

7-10. Aircraft Maintenance Status Log

a. An aircraft maintenance status log (fig. 7-4) may be maintained for reference and to expedite the preparation of DA Forms 1352, 2406, and 2408-3. This chart may be made on 8- by 13-inch typing paper, with a new sheet for each month; or, a more permanent acetate-covered chart may be hung on the wall and used month after month.

b. Daily entries will show the exact status of the aircraft at the *beginning* of the operational day. Entries will be indicated by coloring the appropriate blocks in accordance with the code shown in figure 7-4.

c. The number of hours that an aircraft is on a red X condition each day will be entered in the daily block in the appropriate color (24 hours available per day).

d. If the aircraft status changes during the day from or to EDP, field maintenance, or modification, this change will be shown on the chart the following day.

e. An aircraft for which accountability is lost will be indicated by an L in the status block for the day accountability was terminated. This L will be followed by the number of hours (to the nearest full hour) the aircraft was flown during that portion of the month.

[illegible]

7-9

[illegible]

Figure 7-4. Aircraft maintenance status log.

CHAPTER 8

AVIATION TECHNICAL SUPPLY

Section I. GENERAL

8-1. General

The unit technical supply is the activity from which the organizational mechanic receives the necessary repair parts and tools with which to maintain his aircraft. He also turns in to this activity the old or wornout parts which have been removed from his aircraft. Technical supply is the using end of the parts supply system. It links the organization to the other end of the long supply chain; i.e., the depot repair activity. To establish efficient, economical technical supply for Army aircraft, normal supply procedures may vary because of the location of aircraft in relation to the parent organization or because of the problems peculiar to aircraft operations. General supply procedures are contained in AR 735-35.

8-2. Authority and Scope of Operation

The unit technical supply officer (additional duty) is responsible for the establishment and operation of the unit technical supply. He must insure that the procedures outlined in applicable Department of the Army supply publications are followed. Technical supply is separate from unit supply but is subject to the same inspections and supervision. All technical service items and tools necessary for aircraft operation, not including those items which come under unit supply, will be controlled by the unit technical supply officer. Specific functions of the technical supply include—

a. Maintaining the prescribed load of spare parts based on the -20P for each assigned aircraft. The complete prescribed load will be on hand or on order at all times.

b. Requesting, storing, issuing, and turning in of all spare parts and tools required by the unit to maintain their assigned aircraft.

c. Maintaining the unit tool room for the storage, maintenance, and issue of the organizational maintenance tool sets and aircraft special tools.

d. Assignment and periodic inventory of the general mechanic's tool sets. These sets will be signed out to individual mechanics on a hand receipt which will be filed in the technical supply room.

8-3. Classification and Definition of Air Items

Air items include manned and drone aircraft, trainer and flight simulators, and supplies and equipment used in support thereof which are received, stored, and issued by the Department of the Army. The name of a commodity command preceding the expression "air item" will indicate the supplier responsible for the item; e.g., air items, etc. Classification and definition of air items (AR 710-712) include:

a. *Principal Air Items.* Items which, because of their major importance, require detailed analysis and examination of all factors affecting their supply and demand. Their selection is based upon such criteria as strategic importance, high monetary value, unusual complexity of issue, and procurement difficulties.

b. *Secondary Items.* Any items, including end items, components, and spare parts, which have not been classified as principal items.

c. *Regulated Items.* Items, including end items and secondary items, as listed in SB 55-28 over which Army Materiel Command or delegated authority (U.S. Army Aviation Materiel Command) must exercise close supervision of issues or individual requisitions to insure distribution to proper units and commands in accordance with Department of the Army

priorities because the items are scarce, costly, or of a high technical or hazardous nature.

d. *Nonregulated Items.* All items other than regulated items.

e. *Rapid Service Items.* Stock type secondary items of supply designated for expedited supply action.

f. *Critical Items.* Essential items which are in short supply or expected to be in short supply for an extended period.

g. *Recoverable Items.* Items considered by the cognizant commodity command to be worth being repaired and used again.

h. *Nonrecoverable Items.* Items not considered by the cognizant commodity command to be worth being repaired and used again.

i. *Serviceable Items.* Items which are in condition for use.

j. *Unserviceable Items.* Items which are not in condition for use.

k. *Automatic Return Items.* Secondary items selected by the cognizant commodity command for return to the initial source of supply without recourse to individual line item disposition reporting prior to shipment.

8-4. Federal Supply Classification

The Federal supply classification (FSC) has been developed and adopted by the Office of the Secretary of Defense for use in classifying items of supply identified under the Federal cataloging program. The FSC is designed to permit the classification of all items in the supply system. In order to accomplish this, groups and classes have been established for all items. To identify these groups and classes, the FSC uses a four digit coding structure. The first two digits identify the group, and the last two digits identify the classes within each group. The primary use of the FSC code number is in the Federal stock number (FSN). The FSN for an item consists of the applicable four-digit FSC code number plus the seven-digit Federal item identification number. The Federal supply classification is covered in three indexes as follows:

a. *Part 1. Groups and Classes (Cataloging Handbook H2-1).* This handbook shows all

groups and classes, listed numerically by the four-digit FSC code numbering system.

b. *Part 2. Numeric Index of Classes (Cataloging Handbook H2-2).* This publication presents the names of items included within each class, listed alphabetically under the class number and title.

c. *Part 3. Alphabetic Index (Cataloging Handbook H2-3).* This handbook is an index of all names of items which appear in Part 2, arranged in alphabetical order.

8-5. Army Field Stock Control System (AFSCS)

a. *General.* The Army Field Stock Control System (AFSCS) facilitates the economic distribution of secondary items, with particular emphasis on repair parts. Its objective is to insure that an adequate amount of supplies is in the proper place at the proper time without overstocking at any point of supply. This objective is attained through use of the AFSCS as a tool of operation and management (AR 711-16). This system provides for—

- (1) Establishment of a realistic stockage plan (item and quantitative) at all echelons of supply, based upon demand data of the activities supported. Stocks are maintained in direct relation to consumer requirements.
- (2) Establishment of a uniform method of supply accounting among all commodity commands at the forward supply echelon.
- (3) Establishment of realistic replacement factors for computing requirements, using demand data experience.
- (4) Establishment of realistic organization allowances, based upon demand data experience.
- (5) Establishment of improved parts list, based upon demand data experience.
- (6) Establishment of a method whereby the effectiveness of the supply and maintenance activity may be determined.
- (7) Reduction of the number of items and quantities of items at forward supply echelons.

- (8) Reduction of storage and accounting costs at forward supply echelons by the reduction of items stocked.

b. Consumption Demand Data. The most important element to which any supply system is geared is the rate at which any item is demanded for consumption. This rate is the basis for computing requirements and for effecting sound procurement. Provisions have been made in the Army Field Stock Control System for the recording of true consumption demand data at the installation level of supply and the reporting of this data to U. S. Army Aviation Materiel Command. Prior to the inception of AFSCS, requirements computed at all echelons were based on "issue experience" rather than "demand experience." The use of "issue experience" results in stockage of the items which were actually issued rather than the items which were demanded. For example, if a substitute item is issued due to lack of stock for the item demanded, accumulation of "issue experience" results in the increased stockage at all levels of supply for the substitute item and no stockage for the item demanded. Accumulation "demand experience" results in the stockage requested.

c. Unit Requesting.

- (1) The AFSCS establishes a system whereby using units may request daily, the authorized supplies as required, when supported by a properly executed request document.
- (2) The request flows through the supply channel, without consolidation, to the

first commodity command stockage point, where supply action is taken without delay. The fact that consolidation of requests is eliminated does not lessen the responsibility of supply officers for maintaining a well-managed supply system (AR's 711-16 and 711-17).

8-6. Military Standard Requesting and Issue Procedures (MILSTRIP) and Military Issue Priority System

This system as defined in AR 725-50 requires that the fastest mode of transportation and routing will be used as necessary to meet requirements of operating forces for high priority materiel demands. The objective is to satisfy the customer's materiel demand on time without operating and transportation costs becoming an overriding factor. Effective operation of this system depends on the proper use of urgency of need designators and issue priority designators (app. III, AR 711-17).

8-7. Source of Supply

AR 725-750 designates the source of supply for Transportation Corps supplies and equipment, including air items. The primary function of the technical supply section is to receive, record, store, and issue replacement parts requested from these sources. DA Forms 2765 and 2765-1, Request for Issue or Turn-in (Punched Card Series), will be used for request and turn-in of supplies and repair parts.

Section II. REPAIR PARTS PROCEDURES

8-8. Prescribed Load List (PLL)

The PLL is a mechanical printout prepared by or provided for an organization. It lists the repair parts that are required to be on hand or on order for the performance of organizational maintenance. PLL shows the quantity of combat essential supplies and repair parts (other than ammunition) authorized by major commanders to be on hand in units to enable the unit to sustain itself until resupply can be

effected (normally 15 days level). A copy of the PLL of the organization will be provided the support maintenance and supply unit as prescribed by the support unit commander. The PLL will be computed and repair parts will be stocked at the lowest level at which organizational maintenance is performed requiring repair parts, based on the guidance contained in the -20P for each item of equipment and local directives.

8-9. DA Form 2765-Series

These forms have been designed to initiate a request or turn-in of a single line item. (They replace DA Form 1546.) A detailed description of their preparation and use is contained in AR 711-17.

a. *DA Form 2765, Request for Issue or Turn-In (Mechanical)*. This form is an 80-column single part card designed so that certain common supply management data can be pre-punched and preprinted thereon. These cards are provided each unit for each item on the PLL and other expendable items that are requested on a recurring basis. This form is used only for expendable items and repair parts.

b. *DA Form 2765-1, Request for Issue and Turn-In (Manual)*. This is a three-part carbon interleaved form which is basically the same as DA Form 2765. It is used to request non-expendable items. The first (hard) copy is retained by the supplying activity as a voucher file. The middle (tissue) copy is returned to the requesting organization for due-outs. The third (hard) copy will be returned by the supplier with the requested item.

8-10. Repair Parts Records

a. *General*. Upon approval of the commander for whom the property book is maintained, repair parts records may be established and maintained at the organizational maintenance activity. In such instances, a separate document register (DA Form 2064) and a separate series of document numbers will be established. Units will establish and maintain separate document registers for expendable and nonexpendable property. Separate blocks of serial numbers may be reserved for assignment to expendable and nonexpendable items. Instructions for completing the document register are contained in AR 711-17.

b. *Visible File*. A visible file folder will be used by each unit, organization, or activity authorized to stock repair parts. Repair parts records to be maintained in visible files as follows:

- (1) *Title Insert (Informal Accountability)*, (DA Form 1543). The Title Insert will be prepared for all repair parts authorized for stockage (PLL).

The insert and related records will be filed in the visible files in either alphabetical or stock number sequence. Instructions for filling out the Title Insert are contained in AR 711-16 and AR 735-35. Entries on the Title Insert include—

- (a) Item name.
- (b) Stock number.
- (c) Location.
- (d) Authorized stock level.
- (e) Remarks. These will include end item identification, interchangeability data, unit of issue, and the reference numbers of the Technical Manual or Supply Manual that was used to compute the authorized stock level. Special tagging for insert cards for mission essential equipment should be in accordance with AR 711-16 and AR 735-35.

- (2) *Record of Demands (DA Form 2527)*. The Record of Demands is designed to record quantities of repair parts obtained from a supply activity on a DA Form 2765 by direct exchange, Self-Service Supply Center, or by summary accounting for low-dollar turnover items (SALTI) procedures. The primary purpose of the card is to enable the organization to adjust quantities of repair parts authorized, based upon actual demand experience. A properly prepared Record of Demands will be placed in the visible files in each pocket containing a title insert. Explanation of the entries to be placed on the card is contained in AR 711-17.

- (3) *DA Form 2765*. One of the major advantages of the DA Form 2765 at organizational level is the use of pre-punched (preprinted) forms for each PLL item and other expendables that are requested on a recurring basis. Pre-punched cards will be provided in a minimum of two copies and will be filed in the applicable pocket of the visible file for immediate use.

c. *Due-In Suspense File* (AR 711-17). The due-in suspense file is an up-to-date record of

the current status of items requested for which there is a delayed supply action. This file will permit ready followup to obtain status of items due-in. The unit will maintain a temporary due-in suspense file and a regular due-in suspense file.

- c - |
- (1) DA Forms 2765 returned to units containing due-in information will be filed in a temporary due-in suspense file. Upon receipt of the items, the appropriate card will be removed from the file; after the required entries are made on the supply records, it will be destroyed.
 - (2) When DA Forms 2765 are received by the unit indicating that items have been placed on request by the supporting supply activity, they will be filed in the regular due-in suspense file. Copies previously filed in the temporary file will be destroyed.
 - (3) Upon receipt of a supply status card or a shipment status card, this card will be filed in the due-in suspense file in front of all other cards pertaining to the same item.
 - (4) Followup action may be initiated to determine the status of a request. Such action should not be taken prior to the expected delivery date contained in block 20 of the returned DA Form 2765 or the expected receipt date on the latest status card. Instructions for followup are contained in AR 711-17.
 - (5) Items which are no longer needed should be canceled. Procedures for cancelation of requests are contained in AR 711-17.

8-11. Repair Parts Stockage

a. Major CONUS and oversea commanders will determine the number of PLL's the units within their command will carry. Those units required to have boxed or packaged PLL's on hand because of special mission assignment will compute those quantities separately from the quantities required for operating stocks at their permanent station. Boxed or packaged PLL's will be inspected at least quarterly to insure that—

- (1) Obsolete items are removed.
- (2) Adjustments are made to quantities and

stock numbers are corrected, based upon changes in pertinent DA publications.

- (3) No apparent damage has occurred since previous inspection.
- (4) Items with "shelf-life" dates will be rotated or replaced as required.

b. Repair parts listed in the applicable technical manual for issue only as required may be stocked by a unit provided three or more demands for a particular part have occurred within six review periods (180 days) (AR 735-35).

- (1) A separate DA Form 2527 (Record of Demands) will be prepared when the first request is submitted for any part not on the unit's PLL.
- (2) These forms will be filed in a separate card deck by Federal stock number sequence. Only one card is required for each line item.
- (3) The Record of Demands file will be reviewed each time a posting is made to determine those items which have accrued three or more demands within 180 days, to qualify the item for addition to the organization's PLL.
- (4) Items qualifying for stockage may be added to the PLL after approval of the organization commander and after the supporting supply activity has been informed of the change.
- (5) A quarterly review of the Record of Demands file will be made for the purpose of removing and destroying cards which are no longer applicable to equipment on hand or have no demands during the previous 180 days.

8-12. Revision of Quantities of Repair Parts Authorized for Operational Stocks

The following procedures will be used:

a. Record of Demands cards will be reviewed monthly and a line drawn below the last entry reviewed.

b. For those Record of Demands cards that indicate three or more demands for the most recent six review periods (180 days) the quantity authorized for stockage will be computed based on the days of supply authorized.

c. The quantity resulting from the above

computation will be entered on the Title Insert.

d. The quantity on hand and due-in will be adjusted to the recomputed stock level.

e. The Title Insert and the Record of Demands card for those items turned in as excess will be retained. Further demands will be on an "as required" basis and will be posted to the Record of Demands card the same as for other nonstocked items.

8-13. Forecasting and Submission of Abnormal Requirements

To assure that equipment is in a constant state of material readiness, units will determine and submit forecasts of abnormal requirements for authorized repair parts to their supporting supply activity far enough in advance to assure their availability when needed. This may be accomplished by—

a. Analyzing maintenance management data from the Army Equipment Records maintained in accordance with TM 38-750 and other data made available to the unit in accordance with TM 38-750-1.

b. Determining (from the above analysis and a projection of planned operations) whether there will be an abnormal quantity of authorized repair parts required because of known wear factors, seasonal requirements, and time change considerations.

c. Providing the supporting supply activity with forecast quantities and dates that required parts will be needed; also, notifying support maintenance units if assistance will be needed and the amount needed to accomplish the installation of the abnormal quantity of parts.

Section III. STORAGE AND ISSUE TURN-IN PROCEDURES

8-14. General

Detailed procedures for the storage and issue turn-in of repair parts and tools will normally be contained in the unit maintenance and supply SOP. Every individual within the unit is responsible for studying this SOP and becoming thoroughly familiar with the information it contains. Procedures for the storage and issue of items may vary from one unit to another, but each unit must have a definite plan which will best serve its particular needs.

8-15. Storage

Items stored in the unit technical supply and tool room include—

a. *Parts Ordered For Individual Aircraft.* Parts ordered for a particular aircraft should be stored in a separate bin for the aircraft. These bins should be clearly marked with the aircraft number. Crew chiefs should make periodic checks to determine what parts have been received for his aircraft. When the aircraft is grounded for a major inspection all parts which are in the bin should be installed.

b. *The Prescribed Load List (PLL) of Repair Parts.* The PLL will be kept on hand or on order at all times. These parts will be stored as directed by the technical supply officer, in cabinets, shelves, bins, or other con-

tainers. The location of each part contained in the PLL will be indicated on its DA Form 1543, Title Insert. Specific instructions for the storage of items are contained in AR 700-15 and AR 740-12. The technical supply clerk will insure that items are stored in the proper place in accordance with the applicable directives.

c. *Turned-In Parts.* Turned-in parts will be stored in a separate bin until they are forwarded to the supply support activity. Technical supply clerks must insure that these parts have been inspected and properly tagged prior to being turned in by the crew chief.

d. *Tools.* Tools stored in the toolroom may be aircraft special tools, organizational maintenance tool sets, or general mechanic's sets. The special tools and organizational maintenance tool sets will normally be kept in the toolroom and signed out to individuals as needed. The toolroom clerk must insure that tools are returned after being cleaned and serviced by the using crew chief or mechanic.

8-16. Issue and Turn-in

a. *Repair Parts.* Mechanics and crew chiefs should use DA Form 9-79, or a similar locally produced form, to request parts from the unit technical supply. These forms should be made up in at least two copies. The technical supply clerk will use one copy as a work copy

and will return one copy to the mechanic or crew chief as a receipt. The receipt copy should be kept by the individual until the part is received and then it will be destroyed. Normally, upon receipt of a request for a part the supply clerk will issue the part from the PLL and order a replacement part for stock. If the part is not in stock, it will be ordered and the crew chief will keep his copy of the DA Form 9-79 as a dueout. Crew chiefs who turn in parts to the technical supply will first have the parts inspected and marked either serviceable or unserviceable by the unit technical inspector. Parts will be cleaned, preserved (if required), and properly tagged prior to being turned in. Equipment improvement recommendations will be prepared on DA Form 2407 for those parts which fail before the expected retirement or replacement time.

b. Tools.

- (1) A definite method of accounting for tools signed out from the unit toolroom will be used. A sign out book can be used for components of special tool sets and organizational maintenance sets. These items should be signed out for specific jobs and returned at the completion of the job or at the end of each day, depending on the unit SOP. Mechanics tool sets will be assigned to individual mechanics using a DA Form 2062, Hand Receipt. These hand receipts will be filed in the toolroom in accordance with applicable supply publications.
- (2) Unserviceable or broken tools will be turned in to the unit technical supply by the individual to whom it is assigned. The supply clerk will either issue a serviceable tool or a receipt for the unserviceable tool and order a like item. Items which are turned in permanently will be removed from the individual's hand receipt.
- (3) Every effort must be made to furnish the mechanic with a complete set of handtools and special tools to perform his job. The mechanic can conform with supply economy by using each tool for the purpose for which it was designed; the supervisor can help the

mechanic by recognizing the misuse of tools and the use of tools that are unsafe to the mechanic as well as to the equipment. TM 9-243, "Use and Care of Hand Tools and Measuring Tools," will be readily available for reference by maintenance personnel. A mechanic's tool set that is complete and in good condition shows excellent practice in conservation of materials. Some common tool deficiencies are—

- (a) Broken screwdrivers.
- (b) Wornout files.
- (c) Broken hammers.
- (d) Wrenches with cracked, broken, or sprung jaws and sockets.
- (e) Wornout ~~hatchet~~ handles. p-1
- (f) Spanner wrenches with defective hooks or pins.
- (g) Allen wrenches which are broken or filed to an off size.
- (h) Excessively worn or misaligned plier jaws.
- (i) Diagonal cutters (dikes) with broken or misaligned cutting surfaces.
- (j) Needle-nose pliers with worn or misaligned jaws.
- (k) Cross-point screwdrivers with worn points.
- (l) Broken handles on hand tools.
- (m) Broken or worn points on punches.
- (n) Broken, mushroomed, or misshaped heads on chisels.
- (o) Incomplete steel tapes.
- (p) Inaccurate feeler gages.

8-17. Return of Material

a. Serviceable Equipment. Uninterrupted supply support depends upon timely return of replacement components by the using unit. These components pass through supply channels to the appropriate commercial contractor, Army general depot, or overhaul facility. Forecasts of reparable returns from using units provide basic planning data for the stock control point in establishing workload requirements at contractor and Army depot repair facilities. Repairables not available at the over-

haul facility can disrupt schedules and require revision of plans by Headquarters, Department of the Army.

b. Unserviceable Equipment. Aircraft equipment which cannot be repaired by the using organization is removed from the aircraft and tagged with an exchange tag, DA Forms 2402 or 2410 as appropriate, and turned in for repair and recovery by higher levels. The habitual practice of keeping repair parts in supply channels will make them available when needed.

c. Prompt Turn-In. Organizational maintenance units will operate within basic stock allowances and expedite the prompt turn-in of all repairable and unserviceable equipment.

d. Prompt Evacuation to Higher Maintenance Units. Repair beyond the scope of organizational maintenance will be evacuated to the next higher maintenance activity. Unserviceable organizational repair parts, other than those having no reclaimable value, are replaced by direct exchange.

CHAPTER 9

MAINTENANCE OF ARMY AIRCRAFT UNDER EXTREME WEATHER CONDITIONS

9-1. Desert

a. *Sand and Dust.* The chief maintenance problem in desert operations are caused by sand and dust. When aircraft land and take off, sand and dust are drawn into running engines. These particles act as abrasives on internal parts and adhere to lubricated parts, causing excessive wear. Transparent materials such as plastic windows are pitted by blowing sand, resulting in reduced visibility. To minimize damage caused by extreme heat, sand, and dust—

- (1) Maintenance sites must be selected on the hardest ground available.
- (2) Engine runup test stands should be on concrete, if possible; if not, over a pit filled with rocks or a surface covered with tarpaulins.
- (3) Landings and takeoffs should be made near mooring points to reduce taxiing.
- (4) Engines should not be operated at high speeds over loose sand.
- (5) Engine openings should be covered as soon as the engine is stopped.
- (6) Oil servicing equipment should be kept in a covered, compact box to keep the equipment free from sand.
- (7) Air filters should be inspected often. A clean, extra filter must be available for change during field stops.
- (8) Engines must be cleaned daily.
- (9) Control cable tension must be checked closely. Aircraft structural materials will expand more than cables in extreme heat, thus tightening the cables.
- (10) Pressure in oleo struts must be checked to prevent damage to hydraulic seals.
- (11) The compass fluid level must be checked often.

- (12) When starting the engine, it should be *underprimed* rather than overprimed; amount of prime should be increased as needed.
- (13) To prevent seizure, parking brakes must not be applied until brakes have cooled.
- (14) Aircraft should be parked in the shade, and loose rather than tight covers must be used to protect windshields from damage.
- (15) A close check should be kept on oil consumption to alert maintenance personnel for possible engine change when oil consumption exceeds normal.
- (16) Frequent purging of bearings should be accomplished to force out abrasive materials.

b. *Field Expedients.*

- (1) Helicopter tail rotor leading edges may be damaged by sand. To minimize damage, the leading edges may be covered with cloth-backed tape cut in equal lengths (to preserve balance). The tape should be changed when necessary.
- (2) To protect control linkages from sand (especially the tail rotor pitch change links), they should be covered with chamois secured with safety wire. *Do not impede normal movement of the parts.* This linkage should be inspected regularly to insure that sand is not getting inside the covering.

9-2. Tropical

a. *General.* General precautions used in desert operations should be followed in jungle and delta operations. The high humidity normally encountered in lowland jungles and in delta areas creates additional maintenance problems. All equipment directly exposed to the weather

may be damaged by the hot, humid climate and such equipment requires additional care. Rock and coral surfaces increase tire wear. Poor trafficability impedes maintenance efforts. Clay-type mud creates excessive cleaning problems. Hardstands must be specifically prepared and well drained. Heavy rains, intense heat, and nuisance insects impede maintenance and may cause mechanics to slight their work.

b. Fungus. To prevent fungus damage to electronic equipment, procedures specified in appropriate equipment technical manuals should be followed when applicable. Fungus growths start rapidly on all wood and fabric parts of an aircraft and can be detected only by constant inspection of all portions of the aircraft. This growth will weaken and rot spars and other structural members. Material on which fungus is found must be closely examined and repairs made to prevent structural failure in flight.

c. Rust. High humidity will cause metal parts to corrode quickly. A coating of grease affords some protection; however, these parts must be constantly inspected and grease replaced to prevent adherence of dust particles to the surface, with consequent wear of the part.

9-3. Arctic

a. General. Low temperatures in the Arctic require special practices and maintenance techniques for efficient aircraft operation. Special equipment is required both for the aircraft and for those performing maintenance upon it. In addition to the procedures described in *b* through *h* below, the following must be habitually practiced:

- (1) Before flight, snow and ice must be removed from aircraft surfaces. Only authorized deicing equipment will be used.
- (2) Moving parts must be lubricated with lubricants recommended for temperatures existing in the operational area.
- (3) Before starting engine, heat must be applied to engine(s), instruments, and accessories.
- (4) The oil dilution system must be used to aid engine starting.
- (5) Maintenance personnel must wear gloves when working on parts of the

aircraft or metal materials in extremely low temperatures.

- (6) Work shelters must be provided for maintenance personnel.
- (7) Protective covering must be provided for the engine, propeller, and other portions of the aircraft.
- (8) Exposed portions of shock struts must be free of ice and properly lubricated with hydraulic fluid at all times.

b. Preheater. A standard combustion-type portable preheater is issued in cold climates. It is used to heat the maintenance tents and working areas, and to—

- (1) Apply heat to the engine accessory case, carburetor, induction system, and oil sump before starting engine.
- (2) Melt ice under protective aircraft covers before their removal. Heat may be applied directly to the frozen area or to the entire wing through the wing inspection plates.

Note. Protective covers must be thoroughly dry when not in use and must be stored in a warm, dry place.

- (3) Apply heat to selected areas of the aircraft to permit mechanics to work without gloves for reasonable periods of time.

c. Preflight Preparations. In preflight preparations, it should be determined that—

- (1) Adequate survival gear is aboard the aircraft.
- (2) Flight controls are not frozen or jammed with ice.
- (3) Wing surfaces are free of snow and ice. *Takeoff will not be attempted until wings are clean.*
- (4) Hydraulic brake lines are not cracked or broken.
- (5) Fuel tank vents and oil breathers are free of ice.

d. Engine Starting and Warmup. When starting engines in low temperatures, the following precautions should be taken:

- (1) Use auxiliary power unit (APU) on aircraft so equipped.
- (2) Use oil dilution during engine warm-up to prevent excessive oil pressure.
- (3) Use carburetor heat only when required for fuel vaporization.
- (4) Use additional traction materials on

CHAPTER 10

GROUND SAFETY IN MAINTENANCE WORK

10-1. General

a. The Safety Program. Safety rules and regulations prescribe safe methods and practices for insuring continuous production, safeguarding personnel, and preventing property damage. Although safety is the responsibility of the unit commander, each individual in the unit must be safety-conscious. Each echelon of command will supervise and teach personnel to work safely, eliminate hazards, enforce safety regulations, and investigate accidents.

b. Safety Education. Safety education is a mandatory phase of accident prevention. It helps to develop an internal safety consciousness which, when properly ingrained, will function in any situation. Through this medium, accidents may be prevented which engineering, supervisory, or enforcement measures would not eliminate. Each accident is a symbol of some deficiency which should have been corrected *before* the accident. The "post mortem" safety program is a phase of safety education which stresses corrective action *after* an accident.

c. Accident Reporting and Investigation. Immediate investigation, reporting, and analysis of all accidents which result in injury or property damage are essential elements of an accident prevention program.

- (1) AR 385-40 outlines the procedures for reporting accidents to higher headquarters.
- (2) Correcting causes of minor incidents will help prevent more serious accidents. Even minor incidents which do not require formal reports to higher headquarters should be investigated to determine the cause and necessary corrective action taken to prevent recurrence.

10-2. Prevention of Accidents

Accidents are prevented primarily by improving the individual's knowledge, skill, attitudes, and habits. Safe living requires the ability to function at optimum level in the presence of necessary hazards. Basic safety rules to observe while performing maintenance include—

- a.* Eliminating "horseplay."
- b.* Being alert at all times.
- c.* Wearing clothing that fits properly.
- d.* Removing all jewelry before going on duty.
- e.* Using all available safety guards.
- f.* Using prescribed methods when moving heavy objects.
- g.* Using the right tool for the right job.

10-3. Safety Considerations

The maintenance supervisor must establish high maintenance standards which will eliminate loss of aircraft operational time caused by faulty maintenance. Every member of the unit must practice shop and flight-line safety. A partial listing of practices which should be followed by all shop and flight-line personnel is discussed below.

a. Flight-Line Safety Practices.

- (1) Aircraft will be started, run up, or tested only by qualified aviators or qualified mechanics delegated this duty by the unit commanding officer. A list of such mechanics will be posted on the bulletin board, accessible to all aviators and mechanics (AR 95-13).
- (2) Observe all WARNING and DANGER signs.
- (3) Move the controls of an aircraft only when necessary. Before moving any controls, check to be sure that no one is working on the aircraft.

- (4) Check for the bend radius allowed for each diameter measurement of Teflon hose. Any excess bending may crimp the liner and partially block the hose.
 - (5) Brief passengers on the dangers of being hit by the rotor blades when entering or leaving a helicopter.
 - (6) Brief all personnel who are operating in the area on the places where aircraft will be landing and taking off.
 - (7) Be alert for possible grass fires ignited by the engine or heater exhaust system.
 - (8) Be alert for hazardous exhaust temperatures and velocity of turbine engines when working on, operating, or taxiing aircraft equipped with turbine engines.
 - (9) Never leave the cockpit of any aircraft before double-checking that the magneto switch is in OFF position.
 - (10) Do not work under an aircraft suspended from a hoist without first blocking under the fuselage.
 - (11) Never walk near the arc of a propeller; be careful around aircraft during engine runup.
 - (12) Do not climb or stand on any part of an aircraft except those parts marked for so doing.
 - (13) Avoid using the tail rotor guards to rock observation helicopters in order to get the wheels down. See pertinent maintenance publications for proper method of ground handling these helicopters.
 - (14) Do not rotate main rotor by using tail rotor. The reverse load is detrimental to the tail rotor drive system.
 - (15) Do not yank rotor blades around with a rope. This can damage the pockets and spars.
 - (16) Do not tie down blades more than 6 inches below their normal position.
 - (17) Do not pull rotor through by the blade tips; pull it through from the rotor head.
 - (18) Never disconnect a control or take out part of the control system without tagging the cockpit controls.
 - (19) Do not jack an aircraft in high winds or with personnel inside.
 - (20) Never leave gasoline in an open container. Gas fumes are heavier than air and on a hot windless day can cause a fire many feet from the source of the fumes.
 - (21) Do not breathe gasoline fumes; avoid spilling gas on clothing or skin.
 - (22) Do not lubricate dirty fittings, use a dirty grease gun or containers, or work with dirty hands. The law of lubrication is to *keep everything clean*.
 - (23) Avoid using grease from a container until the container is wiped clean around the lid, plug, or cap.
 - (24) Do not use hydraulic fluid from a can which has been permitted to stand opened and unprotected.
 - (25) Leave lube container closed when not in use. Tighten the cap or plug on a drum with a wrench; hand-screw the cap on a can as tight as possible.
 - (26) Do not paint the bubbles of observation helicopters for protection from the sun. This is not an authorized practice and obstructs the vision of both aviator and observer personnel.
- b. *Shop and Hangar Safety Practices.*
- (1) *Hand tools.*
 - (a) Racks, shelves, and/or toolboxes must be provided for tools not in use to assure immediate accessibility and to eliminate the hazards created by misplaced or forgotten tools.
 - (b) When tools are used on ladders, scaffolds, platforms, or other elevations, special precautions will be observed to prevent them from being dropped or from falling from these levels.
 - (c) Tools will be inspected frequently by responsible personnel and defective tools removed from service for repair or salvage.
 - (d) Tools with sharp cutting edges will be carried in protective covers.

- (e) All power tools must be equipped with guards, all electrical contacts on power tools inclosed, and all wiring well insulated and grounded.
 - (f) Exposed sharp edges should be smoothed down on completion of work.
 - (g) Improvised ladders such as packing cases or barrels should not be used.
 - (h) When parts or items have been removed from aircraft, careless placement about the work area should be avoided. The items should be stowed out of the way or marked so they can be plainly seen either day or night.
 - (i) Sharp edges of material stored should not protrude.
 - (j) Electric drills should not be used inside an aircraft without taking precautionary measures (good ventilation and removal of combustible material and substances) to eliminate fire hazards. The commutator gives off sparks and is a potential source of ignition.
 - (k) Nuts and bolts should be torqued as outlined in appropriate TM. Over-torquing results in destroyed or broken parts.
- (2) *Welding and cutting equipment.*
- (a) During welding or cutting operations, extreme caution will be observed to prevent sparks from starting fires. A fire extinguisher should always be available during these operations.
 - (b) Safety goggles will be provided for operators of oxyacetylene equipment.
 - (c) During electric welding operations, the operator will wear a hand shield or helmet with a shaded filter glass, protective sleeves, gloves, and apron. When other personnel are in the vicinity, these operations will be screened off.
- (3) *Housekeeping*
- (a) Covered fire-resistant rubbish cans will be used.
 - (b) Self-closing covered metal waste cans will be conveniently located about the work area for the disposal of oily rags and waste.
 - (c) Volatile flammable liquids will not be used for washing or cleaning parts and must not remain in open containers. Working quantities of such liquids will be confined to approved containers.
 - (d) Dripping or spilling of oil should be prevented and drip pans or other suitable means should be provided to collect excess oil.
- (4) *Acids.*
- (a) Rubber gloves, goggles, and aprons must be provided for all personnel handling battery acids.
 - (b) Where acid fumes have a toxic, corrosive, or asphyxiating action, approved respirators will be available.
 - (c) Slaked (hydrated) lime should be available for neutralizing large quantities of acid in the event of spillage or breakage of containers. For cleaning acid from floors or equipment, a 10 to 20 percent sodium carbonate solution should be used. All places made slippery by acid may be adequately neutralized with soda or other alkaline solution and washed with water.
- (5) *Static ground.* To reduce the possibility of fire from accumulated static electricity, all aircraft stored in hangars will be provided with proper grounding devices and will be grounded at all times.
- (6) *Smoking.* Smoking will not be permitted within 50 feet of hangars, parked aircraft, and flammable liquid storage points, or inside hangars. "No Smoking" signs will be conspicuously posted in restricted areas. The commanding officer may designate specific areas where smoking is permitted.
- (7) *Fire extinguishers.*
- (a) Approved type, conspicuously marked fire extinguishers will be provided in hangars and on flight lines.

- (b) All fire extinguishers will be properly charged and periodically tested, ready for instant use.
- (c) All unit personnel will be trained in the proper use of fire extinguishers.
- (8) *Ejection seats.* Safety precautions pertaining to specific ejection seat systems may be found in the -10 and -20 TM's on the aircraft in which they are installed. When performing the tasks listed below, maintenance personnel must be familiar with and practice all safety precautions:
 - (a) Removing and installing ground safety lock pins.
 - (b) Removing ejection seat(s) from aircraft.
 - (c) Disarming seats prior to removal.
 - (d) Disconnecting items before removing seat(s).
 - (e) Replacing seat in aircraft and loading cartridges.

10-4. Fuel Handling and Aircraft Service

a. Safety precautions required in this operation cannot be overemphasized. Personnel involved in the handling of aviation fuels, oil, etc., are continually subjected to health, fire, and explosion hazards.

b. To prevent the loss of life and/or expensive equipment, fuel handlers and supervisors must be thoroughly familiar with their duties. A unit training program must be established to insure that all personnel involved in fuel handling and aircraft servicing are standardized in the proper procedures and safety precautions required in this operation. TM 10-1107 outlines the procedures and precautions necessary for safe handling of aviation fuels. TM's 10-1103 and 10-1113 are excellent guides for the operation of specific petroleum handling equipment. TM 55-405-1 outlines procedures for aircraft servicing, to include fueling, defueling, oil servicing, oxygen servicing, etc.

CHAPTER 11

QUALITY CONTROL

Section I. MAINTENANCE STANDARDS

11-1. General

The organizational maintenance officer must insure that no faulty maintenance is performed by any member of the unit and that any aircraft released is safe for flight. Faulty maintenance such as incomplete preflight inspections, improperly assembled parts, an oil change that is past due, or a minute unnoticed crack in the airframe may result in an aircraft accident.

11-2. Maintenance Abuses and Faulty Practices

Practices which result in faulty maintenance include—

- a. Lack of adequate inspections and supervision.
- b. Improper or negligent use of material and equipment.
- c. Lack of lubrication, overlubrication, or use of improper lubricants.
- d. Use of too much pressure when greasing rotor heads, thereby blowing out the seals.
- e. Deferred maintenance.
- f. Improper servicing and adjustment.
- g. Repair by unqualified personnel.
- h. Use of improper or inadequate tools and/or equipment.
- i. Tinkering with an otherwise satisfactory assembly.
- j. Oil dilution.
- k. Continuous use of full throttle.
- l. Taxiing with brakes.
- m. Rough treatment of delicate assemblies.

11-3. Factors Affecting the Army Maintenance System

To develop an efficient Army maintenance system, the commander must—

a. Have a thorough knowledge of preventive maintenance (PM).

b. Provide time for PM, PM training, and personal inspections.

c. Have trained personnel available to perform PM.

d. Motivate his personnel to do their work with precision and enthusiasm.

e. Keep a constant check on control of tools, status of parts supply, and availability of current publications.

f. Provide adequate facilities for the performance of all phases of PM which fall within the responsibilities of his organization.

g. Assure that applicable forms and records are maintained in accordance with TM 38-750.

11-4. Prevention of Faulty Maintenance

Faulty maintenance can be prevented by *proper supervision, training, high morale, and cleanliness.*

a. *Supervision.* Adequate supervision is one of the best methods of preventing faulty maintenance. One supervisor for three to seven subordinates is recommended.

b. *Training.* Maintenance personnel must be continually trained because of changes and alterations in aircraft and components. A mechanic should *always* use a checklist for every maintenance function performed.

c. *High Morale.* Personnel with high morale contribute to the efficiency of an organization. A mechanic who has pride in his work will make fewer errors.

d. *Cleanliness.* Cleanliness of the mechanic, his tools, and his work area contribute to the quality of maintenance. An efficient, well-trained mechanic keeps himself as clean and

greasefree as possible. When a job is completed, his tools are cleaned, his work area is policed, and his aircraft is ready for inspection and flight.

11-5. Preventive Maintenance (PM)

a. Preventive maintenance (PM) is the care and servicing by personnel for the purpose of maintaining equipment and facilities in satisfactory operating condition by providing for systematic inspection, detection, and correction of incipient failures either before they occur or before they develop into major defects.

b. Preventive maintenance is the basic element of the maintenance system. The user must operate equipment properly and must inspect, clean, lubricate, tighten, and adjust it on a systematic basis. Even minor repairs and parts replacement authorized at the organizational maintenance level are preventive in scope, and designed to forestall more complex repairs.

c. Maintenance operations require systematic inspection by the supervisor. He should pay close attention to the planning and execution of the unit's preventive maintenance program. Areas to be considered include—

- (1) Capability of individual mechanics to perform checks and repairs efficiently.
- (2) Efficient assignment of work. Are qualified mechanics supervising the work of less qualified personnel?
- (3) Scheduling and flexibility of maintenance; how deferred maintenance is handled.
- (4) Availability of aircraft for flying.
- (5) Adequacy of facilities with reference to the tactical situation. Shelter, heat, light, and power should be provided for the most comfortable working conditions possible. Many times this will require ingenuity and imagination on the part of the supervisor.

11-6. Preventive Maintenance (PM) Indicators

PM indicators are selected inspection points which indicate, but do not completely establish or confirm, the preventive maintenance status of equipment. These indicators are not a substitute for a thorough inspection, but are a

quick, easy way for the supervisor to keep a running day-to-day spot check on the maintenance of the equipment in his unit. PM indicators for selected items of equipment are contained in DA Pam 750-1. Indicators for some of these items of equipment are discussed below.

a. Aircraft.

- (1) Every time the maintenance supervisor is on the line, he should be inspecting and checking for signs that will indicate how the standards of aircraft maintenance are being met. He must keep in mind the mission of the unit and the time and personnel available. DA Pam 750-1 contains basic instructions for inspecting some of the aircraft in the Army inventory. Because PM indicators are general in nature, a guide for one type of aircraft can be substituted for any aircraft.
- (2) Proper markings, the absence of rust and dents, and cleanliness of equipment are an essential part of maintenance, as well as an indication of high morale and discipline. PM indicators which will affect the operation of the equipment include—
 - (a) Clogged lubrication points.
 - (b) Rust or dirt in bearings.
 - (c) Dirt which affects safe operation, such as on windows or mirrors.
 - (d) Dirty meters, gages, or dials, which will prevent proper readings by the operator.
 - (e) Grease or oil on rubber surfaces.

b. Avionics Equipment.

- (1) Avionics equipment in Army aircraft requires close preventive maintenance supervision for operating efficiency and to prevent equipment repair by the avionics repair unit because of neglect in organizational maintenance.
- (2) The use of preventive maintenance indicators when checking the equipment, antennas, headsets, and cordage assists the supervisor in determining whether or not PM is being performed on the avionics equipment as well as on the aircraft.

c. Tools. The Army maintenance and supply system provides the tools necessary for performance of the organizational maintenance mission. The supervisor must know the nomenclature and use of maintenance tools and be able to recognize unauthorized tools.

- (1) Lack of authorized tools in a unit is evidence of deficiencies in organizational maintenance. Either the maintenance is not being performed or it is being performed with improper tools, which may damage the equipment.
- (2) The maintenance supervisor must prevent the hoarding of tools or possession of unauthorized tools. A spot check of isolated corners in a supply room may uncover tools unauthorized by type or quantity. Such tools may encourage unauthorized maintenance or substitution of tools. The maintenance supervisor should return unauthorized tools to the supply channel promptly; maintenance being performed by a higher echelon could be hampered by the lack of these very tools.

d. Auxiliary Equipment.

- (1) DA Pam 750-1 contains examples of maintenance on equipment similar to that used by an organizational unit; these examples can be applied to the APU's compressors, generators, vehicles, battery charges, and pumps of the aviation section. General cleanliness, tightness, and lubrication is as necessary for the auxiliary equipment as it is for the aircraft. The supervisor should also check to insure that the proper type of fuel is being used in this equipment.
- (2) The equipment operational record must be up to date to indicate the person responsible and whether or not the daily maintenance has been performed.

e. Publications.

- (1) The maintenance supervisor should

check on the availability of required publications. Missing publications may indicate that maintenance is not being properly performed. If shortages exist, a request must be submitted.

- (2) After a manual has been distributed, a good indication of usage is its appearance, e.g., if it is unsoiled, it probably is not being used enough.

f. Repair Parts.

- (1) Repair parts are provided by the Army maintenance system, and indicate to a large extent the maintenance which the organizational unit is authorized to perform. The organizational maintenance unit should have on hand or on order at all times the repair parts authorized for stock in the pertinent -20P parts manual.
- (2) Repair parts must be planned for and requested in advance. Inability to obtain required parts when needed delays repair and reduces the morale of maintenance personnel. Delay in delivery of parts is sometimes caused by difficulties encountered at higher levels of supply, but most delays are caused by carelessness and neglect. Examples of this type delay are—
 - (a) Repair parts are improperly identified on initial requests.
 - (b) Unauthorized and outdated supply manuals and erroneous stock numbers are used.
 - (c) Parts tags and requests are improperly filled out.
 - (d) Requesting is delayed until the last possible minute.
 - (e) Requirements for repair parts are allowed to accumulate.
 - (f) Requests are delayed at some other level in the supply chain.
 - (g) Supply personnel are inadequately trained.
- (3) Since availability of authorized repair parts is a fundamental indication of the maintenance efficiency of the

unit, the supervisor must be familiar with—

- (a) His unit's authorized level of repair parts.

- (b) Requesting procedures and be able to trace any undelivered part in the channels of supply.

Section II. TECHNICAL INSPECTIONS

11-7. Quality Control Through Technical Inspections

a. Frequent and competent technical inspection of aircraft maintenance and equipment is the basis for good quality control. Repeated rejects on final inspection indicate quality control laxity, which adversely affects organizational efficiency.

b. As maintenance on the aircraft progresses, the work is continuously inspected. When the crew chief or mechanic reports an aircraft ready for flight after maintenance, the technical inspector will check for quality and completeness of work and general condition of the aircraft. Test flight is performed in accordance with TB AVN 23-16 and the appropriate aircraft -10 TM.

c. Technical inspections will also reveal faults that require the replacement of a repair part. Any repair part needed in the maintenance of aircraft must be requested immediately.

11-8. Types of Inspections

The two types of inspections performed on organizational equipment are *command* maintenance management and *spot check*. AR's 750-1, 750-5, and 750-8 prescribe procedures for conducting these inspections.

a. *Command Maintenance Management Inspections (CMMI)*. These inspections are designed to provide commanders with an indication of the maintenance operational efficiency of each subordinate unit or activity, and to measure the proficiency and effectiveness of organizational and support maintenance units. This evaluation of maintenance operations is obtained through inspection of sample items of materiel for physical condition and inspection of maintenance practices and procedures.

b. *Spot Check Inspections*. These inspections are conducted periodically by the commanding officer of the aircraft support maintenance facility to determine the condition of aircraft maintenance records, and technical supply and

maintenance operating procedures of the Army aviation section. These inspections may be executed in conjunction with maintenance and supply assistance service (AR 750-22). At the conclusion of the inspection, deficiencies and necessary corrective action will be reported to the aviation officer.

11-9. Technical Inspector (Organizational)

The duties of the technical inspector in the maintenance section of an aviation unit are determined by the aircraft maintenance officer and are based on the type of unit and its needs. He will perform all technical inspections on assigned aircraft and equipment and will determine the serviceability of removed parts prior to their turn-in. He must inspect and sign off all red X and circled red X conditions on the DA Form 2408-13 before the aircraft is flown. Also, he will inspect all unit maintenance at specified intervals to insure that a high standard of maintenance prevails. The technical inspector must be trustworthy, respected by other mechanics, and thoroughly trained in his MOS. He is the direct representative of the unit commander and the maintenance officer and must keep them informed on the effectiveness of the maintenance system at all times.

11-10. Technical Inspector (Support Maintenance)

The technical inspector in a support maintenance unit performs technical inspection of aircraft for all levels of maintenance upon receipt from and prior to return to using units. He establishes production and quality control procedures, inspects engines, components, systems, and instruments for wear and evidence of damage, and determines parts required. He also inspects items to determine that repairs are adequate. In addition to his duties as an inspector, he performs administrative and supervisory duties, coordinates workflow of maintenance sections, and controls work distribution.

APPENDIX I

REFERENCES

AR 11-14	Material Readiness.
AR 95-13	Safety Procedures for Operation and Movement of Army Aircraft on the Ground.
AR 95-16	Weight and Balance—Army Aircraft.
AR 95-87	Aircraft Hurricane Evacuation.
AR 220-1	Unit Readiness.
AR 310-1	Military Publications: General Policies.
AR 310-3	Military Publications: Preparation, Coordination, and Approval.
AR 310-32	Organization and Equipment Authorization Tables; Personnel.
AR 320-5	Dictionary of United States Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.
AR 350-22	Quotas for Enlisted Specialist Training.
AR 380-5	Safeguarding Defense Information.
AR 385-series	Safety.
AR 600-200	Enlisted Personnel Management System.
AR 700-15	Preservation, Packaging, and Packing.
AR 700-18	Repair Parts Allocation and Allowances.
AR 700-26	Designating, Redesignating, and Naming Military Aircraft.
AR 710-12	Army Aircraft Inventory, Status, and Flying Time (Reports Control Symbol AMC-130).
AR 711-16	DSU/Installation Stock Control and Supply Procedures.
AR 711-17	Utilization and Processing of DA Forms 2765 and 2765-1, Request for Issue or Turn In (Punched Card Series).
AR 725-14	Maintenance Float Aircraft.
AR 725-50	Requisitioning, Receipt, and Issue System.
AR 735-35	Supply Procedures for TOE Units, Organizations, and Non-TOE Activities.
AR 740-12	Covered and Open Storage of Supplies.
AR 750-1	Maintenance Concepts.
AR 750-5	Organization, Policies, and Responsibilities for Maintenance Operation.
AR 750-6	Maintenance Support Planning.
AR 750-8	Command Maintenance Management Inspections.
AR 750-10	Materiel Readiness (Serviceability of Unit Equipment).
AR 750-22	Technical Assistance Program.
AR 750-23	Premature Removal of Installed Aircraft Engines.
AR 750-50	Use of Controlled Cannibalization as a Source of Low Mortality Repair Parts Supply.
AR 750-712	Modification of Army Aircraft and Transportation Air Items.
AR 750-713	Repair and Overhaul of Army Aircraft.
AR 750-1500-2	Technical Publications for Aircraft Files.
AR 750-1500-8	Use of Serviceable Parts from Unserviceable Aircraft or Aircraft Components.

FM 1-5	Army Aviation Organizations and Employment.
FM 1-15	Aviation Battalion.
FM 1-100	Army Aviation.
FM 5-20	Camouflage, Basic Principles and Field Camouflage.
FM 5-22	Camouflage Materials.
FM 21-5	Military Training Management.
FM 21-6	Techniques of Military Instruction.
FM 21-30	Military Symbols.
FM 29-31	Maintenance Battalion, Division Support Command.
FM 31-70	Basic Cold Weather Manual.
FM 55-45	Aircraft Maintenance Services and Units in the Field Army (under preparation.)
FM 101-10, Part I	Staff Officers Field Manual: Organizational Technical and Logistical Data—Part I, Unclassified Data.
TM 1-series	(Aviation.)
TM 9-243	Use and Care of Handtools and Measuring Tools.
TM 10-1101	Petroleum-Handling Operations.
TM 10-1103	Quartermaster Petroleum Handling Equipment.
TM 10-1107	Petroleum Handling Operations for Aviation Fuel.
TM 10-1113	Petroleum Tank-Vehicle Operation.
TM 11-series	(Signal.)
TM 38-750	Army Equipment Record Procedures.
TM 38-750-1	Maintenance Management: Field Command Procedures.
TM 38-750-2	Maintenance Management: National Agency Procedures.
TM 55-series	(Transportation.)
TM 743-200-1	Storage and Materials Handling.
DA Pam 20-21	The Army School Catalog.
DA Pam 108-1	Index of Army Motion Pictures, Filmstrips, Slides, Tapes, and Phonorecordings.
DA Pam 310-series	Military Publications Indexes.
DA Pam 750-1	Preventive Maintenance Guide for Commanders.
DA Pam 750-2	Post Level Preventive Maintenance Course.
DA Pam 750-38	Army Equipment Record Procedures.
TB AVN 2	Recommended Fuel, Engine, and Transmission Oils for Army Aircraft.
TB AVN 7	Painting and Marking of Army Aircraft.
TB AVN 23-2	Use of Tricresyl Phosphate Concentrate (TCP) in Aviation Fuel.
TB AVN 23-8	Reporting Criteria and Instructions for Processing Damaged or Deteriorated Aircraft.
TB AVN 23-10	Aircraft Accessory Replacement and Reuse Procedures.
TB AVN 23-13	Anti-Icing, Deicing, and Defrosting of Parked Aircraft.
TB AVN 23-16	Test Flights and Maintenance Operational Checks for Army Aircraft.
TB AVN 23-62	Uses and Grades of Aircraft Engine Lubricating Oils.
TB AVN 23-63	U. S. Army Aircraft Fire Fighting and Rescue Manual.
TB AVN 23-67	Army Aircraft Maintenance Inspection Procedures.
TB AVN 23-72	Mutilation of Condemned Aeronautical Equipment Prior to Disposition.
TB 11-series	(Signal.)
TB 55-series	(Transportation.)
SB 1-1	Army Aircraft Flying Hour Factors and Forecast.
SB 55-28	Issue of Supplies and Equipment: Transportation Regulated Items.
SB 708-21	Federal Supply Classification; Part 1: Groups and Classes (Cataloging Handbook H2-1).
SM 55-series	(Transportation.)

APPENDIX III

INSPECTION GUIDES FOR ORGANIZATIONAL MAINTENANCE
AND TECHNICAL SUPPLY

Note. These inspection guides will assist the organizational maintenance officer in performing inspections. They are not intended to be regulatory and may be modified as required. Additional guidance is contained in DA Pam 750-1.

I. MAINTENANCE OPERATION TECHNICAL INSPECTION GUIDE

Section I. GENERAL

1. Are maintenance records and facilities properly located in relation to each other and to the flight line? To the technical supply?
2. Is there a planned maintenance program actively supervised and controlled by a qualified maintenance officer?
3. Is the technical supply officer responsible to the maintenance officer?
4. Are necessary tools and repair parts for aircraft on hand and properly maintained?
5. Are working areas policed and free of safety hazards?
6. Are maintenance personnel properly supervised?
7. Are unauthorized tools and equipment on hand?
8. Does completed maintenance on aircraft undergo technical inspection prior to its release for flight?
9. Is there a clearcut SOP in effect between the mechanics and technical supply?
10. Is lateral transfer of parts controlled?
11. Is there a suitable area set aside for maintenance personnel to work on records, study technical manuals, etc.?
12. Is the maintenance office set up in an orderly manner with the required charts, files, technical manuals, etc., and arranged for the most efficient utilization?
13. Other?

Section II. ACCESSORY REPLACEMENTS

14. Are scheduled accessory replacements made at the nearest scheduled inspection time?
15. Are DA Forms 2410 initiated for applicable accessories upon removal from aircraft?

16. Are accessories ordered in advance as specified in the maintenance SOP?
17. Is proper procedure being used when accessory replacement time is extended?
18. Is the accessory replacement chart correctly prepared and does it include all required items?
19. Are circled replacement times backed up by parts request slips or a letter of notification to the field maintenance activity?
20. Do the replacement times agree with those in DA Form 2408-16?
21. Is the "Aircraft hours to date" column kept current?
22. Is the accessory replacement time circled when the accessory has been ordered?
23. Is the field maintenance activity properly notified of accessory changes for which they will be responsible as required in the maintenance SOP?
24. Other?

Section III. ARMY AIRCRAFT INVENTORY, STATUS,
AND FLYING TIME REPORT (DA FORM 1352)

25. Are all blocks of the heading properly filled out?
26. Are the authorized aircraft listed by category?
27. Does Column C show a code for each aircraft?
28. Does Column D reflect the correct number of accountable hours?
29. Does Column D equal the sum of Columns E and F?
30. Does Column F equal the sum of Columns G, H, I, J, and K?
31. Is the aircraft daily status chart correctly prepared and utilized as required?
32. Other?

Section IV. MAINTENANCE FILES

33. Are files neatly arranged and properly identified?
34. Are DA Forms 2408-13 for the current month filed in a separate folder?
35. Is the current DA Form 2408-16 for each aircraft filed with the records for that aircraft?
36. Are the aircraft forms for the previous 6 months properly filed?
37. Is a work request file maintained, with completed work orders separated from those in suspense?
- ★38. Are the loose equipment checklists for the aircraft filed in the Equipment Log Book?
39. Is an EIR file maintained?
40. Is a file of Army Aircraft Inventory, Status, and Flying Time Reports maintained?
41. Are maintenance directives, memoranda, etc., properly filed for easy reference?
42. Are duplicate copies of parts request slips, with supply action indicated, kept for each aircraft?
43. Are the required aircraft publications, less the maintenance records, complete and filed in a suitable location?
44. Other?

Section V. AIRCRAFT STATUS

45. Is a record of the current aircraft maintenance status kept as indicated in the maintenance SOP or by an equally efficient system?
46. Is the following information reflected: Total

aircraft hours, next inspection due, aircraft hours next inspection due, hours remaining to next inspection, and date and reason aircraft is grounded?

47. Is all information accurate and current?
48. Other?

Section VI. TECHNICAL MANUALS

49. Are technical manuals on hand and filed?
50. Are required technical manuals on hand or on request?
51. Are changes properly posted?
52. Is followup action taken when requests are ineffective?
53. Is the current applicable DA Form 92-series on file and periodically reviewed?

Section VII. MATERIEL READINESS

54. Is equipment serviceability properly determined?
55. Are DA Forms 2408-3 submitted as prescribed?
56. Are DA Forms 2406 properly filled out and one copy submitted direct to the U.S. Army Maintenance Data Processing Center?
57. Are files maintained on ESC?
58. Are all forms and records for assigned equipment maintained in accordance with TM 38-750?
59. Are the procedures outlined in AR 11-14 being implemented and followed?
60. Does the unit profile indicate that the unit is combat ready?

II. TECHNICAL SUPPLY INSPECTION GUIDE

Section I. SUPPLY PROCEDURE (GENERAL)

1. Are supply facilities adequate?
2. Are supplies properly stored, identified, and safeguarded?
3. Are excess supplies on hand?
4. Are TOE and memorandum receipt items handled through tech supply?
5. Are supply files neatly arranged?
6. Are unserviceable, recoverable items allowed to accumulate in the maintenance area?

7. Are serviceable items, except common hardware and emergency items in the aircraft, kept in the supply room until needed?
8. Is close supervision exercised over the issue and receipt of parts?
9. Are accessory replacement items for a particular aircraft marked and held for that aircraft until needed?
10. Are flammable items stored properly?
11. Other.

Section II. REQUESTING PROCEDURE

12. Is the DA Form 2765 properly prepared showing correct stock number and nomenclature, authorized amount (on hand ^{and} due in), basis, authority, type of request, property class, and tech service?

13. Are requests submitted when required?

14. Is correct procedure used to upgrade or downgrade requests?

15. Is correct lateral supply procedure used?

16. Are EDP requests for gradual wear items backed up by previously submitted requests?

17. Other?

Section III. TURN-IN PROCEDURE

18. Is the DA Form 2765 properly prepared showing correct stock number and nomenclature?

19. Are unserviceable, recoverable items thoroughly cleaned, properly tagged, and promptly turned in to the appropriate commodity command?

20. Are unserviceable tags properly filled out showing reason and previous operating time?

- 21. Are EIR exhibits properly tagged?
- 22. Is only one property class entered on a turn-in slip?
- 23. Other?

Section IV. STOCK LEVELS

24. Are stock levels based on usage factor?

25. Are letters of authorization on file to back up changes in stock level?

26. Are stock level adjustments made when usage varies because of weather or special operation?

27. Are requests for items which are normally field maintenance responsibility backed up by a letter of authorization from the responsible field maintenance officer?

28. Other?

Section V. PARTS REQUEST SLIPS

29. Is required information shown?

30. Are slips neat and legible?

31. Is the duplicate returned to the mechanic or records clerk with suspense number entered?

32. Other?



SLS ch 1
form standards for all units in the active Army. It requires an overall evaluation of personnel, training, and logistics for each combat unit and combat support unit. The unit equipment profile (UEP) is combined with supply, training, and personnel status. This combination results in a definite expression of the unit's combat readiness that can be compared with the operational mission of the unit. The readiness report is based on the following categories of information:

- (1) *Readiness requirement (REDCAT)*. The level of readiness assigned in peacetime to each unit of a command as required by that command to accomplish its assigned missions in relation to the deployment schedule of the unit.
- (2) *Readiness capability (REDCAPE)*. The level of readiness assigned each unit which is within the capability of the major Army command to support with programed and/or allocated resources.
- (3) *Readiness condition (REDCON)*. The actual level of readiness of a unit.

d. Equipment Maintenance Record (DA Form 2408-3). DA Form 2408-3 provides a record of maintenance services, inspections, and repairs requiring parts usage at the organizational level. It also provides a method of recording and reporting status of equipment availability and serviceability and is a source document for the collection of maintenance en-

gineering data. This form will be closed out at the end of each calendar month. The national maintenance point copy (copy 3) for all items listed in appendix III, TM 38-750, will be forwarded to the appropriate addressee. Prior to submitting this form the unit must perform an equipment serviceability criteria evaluation. The findings of this evaluation will be entered in block 14 and explained in block 12.

e. Materiel Readiness Report (DA Form 2406). DA Form 2406 provides information on the readiness status of equipment in the hands of using organizations. This report will be prepared on a monthly basis for selected items of equipment and copies will be sent in accordance with TM 38-750. Information in the report is designed to—

- (1) Provide commanders at lower levels with equipment status information for planning day to day operations.
- (2) Provide installation and organization commanders with information on maintenance backlogs, serviceability of equipment, density of equipment, and availability of equipment for operations.
- (3) Provide commanders with the materiel readiness status of equipment in using units.
- (4) Provide the desired condition of materiel readiness for designated items of equipment to the Department of the Army.

Section II. EQUIPMENT RECORD PROCEDURES

3-4. General.

TM 38-750 contains the Army equipment record procedures to be used for the control, operation, and maintenance of all Army equipment. It prescribes procedures for the use, preparation, and disposition of forms and records of the Department of the Army's integrated equipment record and maintenance management system. Proper use, preparation, and submission of the forms covered in TM 38-750 by operational units is the key to the entire integrated system. These forms are used by the commander to check his operational status,

trouble spots, and equipment use and performance. TM 38-750 prescribes the records which are required for each item of equipment and lists those forms and records which provide input to logistic management. The following is the scope of TM 38-750.

a. Application of the integrated system to Army equipment in support of effective materiel readiness.

b. Mandatory equipment improvement reporting.

c. Recording and mandatory reporting of

MWO (modification work order) requirements and accomplishments.

d. Correlation between equipment technical manuals and the integrated system.

e. Recording essential information to be used for evaluation of materiel readiness as prescribed by maintenance management procedures (TM 38-750-1).

f. Engineering data for design of new equipment, redesign of standard equipment, and product improvement.

3-5. Forms and Records

The following forms and records are used by organizational aircraft maintenance units. Instructions for their use, preparation, and disposition are contained in TM 38-750.

a. *DA Form 2402, Exchange Tag*. This form will be used to identify unserviceable parts being exchanged, repaired, or held as an EIR exhibit.

b. *DA Form 2404, Equipment Inspection and Maintenance Worksheet*. The DA Form 2404 provides a standard procedure for recording—

- (1) Equipment faults found as a result of inspection, by maintenance activities, diagnostic checkouts, and spot check inspection of equipment.
- (2) The results of command maintenance inspection (CMMI), when desired as a worksheet only.
- (3) The results of equipment serviceability criteria tests and checks prescribed by AR 750-10.

c. *DA Form 2405, Maintenance Request Register*. This is an internal shop management record which provides a record of maintenance requests (DA Form 2407) and component removal and repair/overhaul records (DA Form 2410) processed within a maintenance activity.

d. *DA Form 2406, Materiel Readiness Report*. For an explanation of this form, see paragraph 3-3e.

e. *DA Form 2407, Maintenance Request and DA Form 2407-1, Continuation Sheet*. These forms are used at organizational level to—

- (1) Request maintenance services.
- (2) Report accomplishment of modification work orders.

- (3) Record maintenance services performed.
- (4) Submit equipment improved recommendations (EIR).
- (5) Report receipt of defective materiel, except items damaged in shipment.
- (6) Provide information for maintenance data collection.

f. *Equipment Logbook Binder* (FSN 7510-889-3494). The equipment logbook binder will contain those forms prescribed for each item of equipment and will remain with the equipment to which it pertains.

g. *DA Form 2408, Equipment Log Assembly (Records)*. This form is a permanent part of the logbook and is used to provide a ready reference to assembly instructions and symbols to be used in equipment logs.

h. *DA Form 2408-3, Equipment Maintenance Record (Organizational)*. For an explanation of this form, see paragraph 3-3d.

i. *DA Form 2408-5, Equipment Modification Record*. This form is used to record the requirements for an application of all authorized modification.

j. *DA Form 2408-7, Equipment Transfer Report*. The transfer report provides a record of transfer of items on which a historical record is mandatory, and for which maintenance data is to be collected as indicated in TM 38-750.

k. *DA Form 2408-8, Equipment Acceptance and Registration Record*. This form is strictly informational at user level. It is used to record the status of the equipment when it is received from the manufacturer, and provides a record of overhaul and rebuild on equipment other than aircraft while in the Army inventory. DA Form 2408-15 is used for aircraft.

l. *DA Form 2408-12, Army Aviator's Flight Record*. This form is used to record actual aircraft time and duty and type of flight performed by the aviator and crew.

m. *DA Form 2408-13, Aircraft Inspection and Maintenance Record*. This form is used to—

- (1) Record detected faults and the action taken to correct them.
- (2) Maintain a continuing record of aircraft flying hours.

- (3) Record maintenance and servicing performed.
- (4) Indicate when scheduled maintenance inspections come due.
- (5) Indicate status of the aircraft and of installed mission essential equipment.

n. *DA Form 2408-14, Uncorrected Fault Record.* This form is used to record uncorrected faults to include overdue replacement of components, and the reason therefor.

o. *DA Form 2408-15, Historical Record for Aircraft.* The historical record is used to record significant historical data for an aircraft while it is in the Army inventory.

p. *DA Form 2408-16, Component Installation and Removal Record.* This form is used as a permanent record of time change components and selected condition items that are installed or have been removed from an aircraft.

q. *DA Form 2408-17, Aircraft Inventory*

Record. This form provides an accurate and exact checklist of property assigned to the aircraft which is subject to accountability requirements.

r. *DA Form 2408-18, Equipment Inspection List.* This form is used to maintain a list of inspections accomplished at intervals which are not related to airframe operating time or aircraft inspection intervals.

s. *DA Form 2409, Equipment Maintenance Log (Consolidated).* This form is used as a separate equipment log and provides a complete maintenance history of an item of equipment.

t. *DA Form 2410, Component Removal and Repair/Overhaul Record.* This form provides a record and report for the control of all aircraft engines and specific aircraft components. It will be prepared for all time change components and selected condition items.



he must be aware of his obligations as an individual.

- (1) *Individual obligations.* The success of the mission is ultimately determined by the performance of each individual in the organization. Each must—
 - (a) Subordinate his personal desires to those best for the organization.
 - (b) Be loyal to superiors.
 - (c) Show initiative. Personal ideas should be submitted through a suggestion box or in conference with the supervisor.
 - (d) Work compatibly with associates. This includes respecting the rights of others, advising and helping associates, being honest, and avoiding jealousy.
- (2) *Supervisory obligations.* A supervisor must be able to think clearly and rapidly, talk convincingly, listen attentively, and discriminate between right and wrong conduct and good and poor work performance. Specific supervisory obligations include—
 - (a) Realizing that the organization is composed of a group of individuals, each wanting to be treated as an individual.
 - (b) Taking a personal interest in each man.
 - (c) Carefully considering job assignments and placements.
 - (d) Recognizing efficient performance. Publicly praising an individual for a job well-done stimulates good will and cooperation.
 - (e) Punishing the guilty, not the group.
 - (f) Developing initiative through the assignment of reasonable workloads, occasional projects to be

worked out by individuals, and added authority.

c. *Utilization of Personnel.* The five basic methods of using manpower wisely are—

- (1) *Assigning the right man to the right job.* Personnel should be assigned the particular jobs they can do best consistent with their present level of training, then be further trained on the job.
- (2) *Increasing availability of manpower.* Manpower availability depends upon health, safety, and reduction in absenteeism.
 - (a) A clean, warm, dry, well-lighted working space should be provided.
 - (b) Ground safety rules, and safe practices and procedures must be enforced.
 - (c) Mechanics (military) must attend specified classes, drills, physical training activities, etc. Work should be scheduled so that these absences will not disrupt operations.
- (3) *Stimulating the will to work.* This can be accomplished by the supervisor's personal interest in the men, proper training and assignments, promotions, increased responsibilities, or written commendations.
- (4) *Increasing the ability to produce.* This is best accomplished through continuous training (on-the-job training if the man can produce while learning) and up-grade training (more responsible duties on larger and more complicated aircraft) for mechanics.
- (5) *Fully utilizing a man on essential tasks.* This is achieved by scheduling a full day's work for each man.

Section I. MOS STRUCTURE

4-4. MOS Proficiency Requirements

a. AR 600-200 lists the duties, skills, and knowledge required of each MOS for enlisted men in the aviation maintenance field. This regulation, used in conjunction with the unit TOE, TD, or TA, will guide the maintenance super-

visor in placing enlisted men in positions commensurate with their MOS numbers. Every effort should be made to use a man in his highest MOS.

b. Job titles, with MOS numbers and a brief explanation of the qualifications of the school-

trained organizational mechanics, are listed below:

- (1) *Aircraft maintenance crewman (67-A10)*. This crewman is trained on the basic aviation subjects and special crewman subjects, including the use of technical manuals, forms, and records; the fundamentals of construction and function of aircraft components such as reciprocating and turbine power plants; and aircraft systems. He is qualified as a mechanic's helper and to perform operational duties required at Army airfields, such as fueling, servicing, guiding taxiing aircraft, ground handling and mooring, and fire and crash rescue.
- (2) *Single-engine observation-utility airplane mechanic (67B20)*. This mechanic is trained and qualified to perform all organizational maintenance on O-1 (Bird Dog) and U-6 (Beaver) airplanes. He is also qualified to serve as crew chief for either airplane.
- (3) *Single-engine light cargo airplane mechanic, U-1A (67C20)*. This mechanic is qualified to serve as a crew chief on the U-1A (Otter). He is also qualified in MOS 67B20.
- (4) *Multi-engine command airplane mechanic (67G20)*. This mechanic is qualified to maintain the U-8 (Seminole); he is also qualified in MOS 67B20.
- (5) *Multi-engine observation airplane mechanic (67H20)*. This mechanic is qualified to maintain the OV-1 (Mohawk); he has the secondary MOS of 67B20 and may have one or more of the other specialized airplane mechanics' MOS's (67C20 and/or 67G20).
- (6) *Multi-engine medium transport airplane mechanic (67J20)*. This mechanic is qualified to maintain the CV-2 (Caribou); he has the secondary MOS of 67B20 and may also have other airplane mechanics' MOS's.
- (7) *Single-engine single-rotor observation helicopter mechanic (67M20)*. This mechanic is trained and qualified to perform all organizational maintenance on OH-13 (Sioux) and OH-23 (Raven) helicopters. He is also qualified to serve as crew chief for either helicopter.
- (8) *Single-engine single-rotor turbine utility helicopter mechanic (67N20)*. This mechanic is qualified to serve as crew chief for the UH-1 (Iroquois); he is also qualified in MOS 67M20.
- (9) *Single-engine single-rotor utility/light transport helicopter mechanic (67P20)*. This mechanic is qualified to serve as crew chief and maintain the UH-19 (Chickasaw) and CH-34 (Choctaw) helicopters; he is also qualified in MOS 67M20, and may be further qualified in MOS 67N20.
- (10) *Single-engine tandem-rotor helicopter mechanic (67S20)*. This mechanic is qualified to serve as crew chief and maintain the CH-21 (Shawnee) helicopter; he has the secondary MOS of 67M20. He may also be qualified in one or more of the other helicopter MOS's (67N20 and/or 67P20).
- (11) *Multi-engine single-rotor helicopter mechanic (67T20)*. This mechanic is qualified to maintain the CH-37 (Mojave) helicopter. He will have a secondary MOS of 67M20, and either or both MOS's 67P20 and 67S20.
- (12) *Multi-engine tandem-rotor helicopter mechanic (67U20)*. This mechanic is qualified to serve as crew chief and maintain the CH-47 (Chinook) helicopter. He will have a secondary MOS of 67M20 and must have 1 year of field experience in either MOS 67N20, 67P20, 67Q20, 67S20, 67S30, 67T20, 67T30, or be qualified in MOS 67W20 or 67Z40.
- (13) *Airplane technical inspector (67F20) or helicopter technical inspector (67W20)*. The 67F20 is qualified to complete initial and final inspections of all airplanes, and will have secondary MOS's of 67D20 and 67K20. The 67W20 inspector is qualified to conduct initial and final inspection on

CHAPTER 5

ORGANIZATIONAL MAINTENANCE OPERATIONS

Section I. ORGANIZING TO PERFORM MAINTENANCE

5-1. General

a. *Organizational maintenance* is that maintenance which is performed by a using organization on its own equipment as authorized by the appropriate maintenance allocation chart. It mainly consists of preventive maintenance, to include—

- (1) Inspecting, cleaning, servicing, preserving, lubricating, and adjusting, as required.
- (2) Replacement of minor parts not requiring highly technical skills.
- (3) Computing, requesting, and storing the prescribed load of spare parts.

b. Organizational maintenance is usually performed by the mechanics of the service platoon or other maintenance sections, assisted by the assigned crew chiefs. Normally, the crew chief will perform all organizational maintenance on his aircraft which is within his capability and which can be accomplished with his own tools. When the maintenance required exceeds his ability, or requires additional skills or tools, this maintenance will be performed by the service platoon or higher maintenance units.

c. Work performed by the mechanics and crew chiefs must be closely coordinated to insure that effective and efficient organizational maintenance is performed. Requirements for special tools and equipment are directly related to the type and number of aircraft maintained by the unit, and to the category of maintenance performed. Authority for organizational tools and equipment is contained in the -20P (aircraft technical parts manual) for each type of aircraft or engine. Each unit is required to have the authorized special tools and equipment, and the prescribed load of parts at all times.

5-2. The Service Platoon or Maintenance Sections

a. *Mission.*

- (1) The service platoon or maintenance sections (hereafter referred to as service platoon) normally provides organizational maintenance for organic aircraft and wheeled vehicles, communications and sensor equipment, aircraft parts resupply, refueling service, and limited armament kit maintenance. The mission of the platoon may vary, depending on the type of unit and the equipment maintained.
- (2) Specific duties of the platoon which are directly related to aircraft maintenance and supply include—
 - (a) Performing organizational aircraft maintenance for the company, assisted by the crew chief of the specific aircraft.
 - (b) Requesting and stocking aircraft repair parts, tools, and related supplies.
 - (c) Performing aircraft technical inspections and insuring quality control in all maintenance performed.
 - (d) Assisting in the performance of scheduled inspections of the assigned aircraft.
 - (e) Performing aircraft refueling, servicing, and crash rescue operations at the company airfield.
 - (f) Preparing job requests for support maintenance and insuring that organizational deficiencies are corrected before aircraft are released to support units.
 - (g) Receiving aircraft from support maintenance after checking the

forms and records, the work performed, and the completeness of accompanying equipment.

b. *Organization.* The service platoon is usually located at the company airfield near the company headquarters. It normally consists of a platoon headquarters, an aircraft maintenance section, a communications maintenance section, and an airfield service section.

(1) *Platoon headquarters.* The platoon headquarters contains the aircraft maintenance office, the wheeled vehicle maintenance section, and the aviation technical supply area.

(a) *The aircraft maintenance office.* The maintenance office is normally located in a tent, a maintenance hangar, or a shop van. The physical layout is determined by the mission and facilities of the particular maintenance organization. To facilitate aircraft maintenance, necessary records, files, technical manuals, and other pertinent material are filed in this office. These serve as a ready reference for officers, inspectors, supervisors, mechanics, and clerks in planning and scheduling duties and workload, and in evaluating work already performed. A complete technical reference file on all aircraft on which the unit may perform maintenance is located in this area, and is available to supplement the records which accompany each aircraft. A specific place must be provided where these references may be studied. Personnel located in this office are the platoon leader, who is also the aircraft maintenance officer; the platoon sergeant; the technical inspectors; and the shop clerk.

(b) *Wheeled vehicle maintenance section.* It provides organizational maintenance for organic wheeled vehicles. It will normally be located in the same general area of the company headquarters. The tactical situation will dictate the degree of dispersion required. Personnel as-

signed to this section include a motor sergeant, wheeled vehicle mechanics, and helpers.

(c) *The aviation technical supply area.*

This area includes the office of the technical supply officer (additional duty), and the parts and equipment storage area and issue point. It should be located close to the aircraft maintenance area so it will be readily accessible to the aircraft mechanics. It is desirable to have the spare parts and tools in the hangar where the maintenance is performed; however, they may be located in adjacent buildings, tents, or shop vans, if available. In no case should its location create a hardship on the mechanics and require excessive travel time to and from the area.

(2) *Aircraft maintenance section.* The aircraft maintenance section is located in the area which will be the most desirable for conducting maintenance. This may be a hangar, tent, or other suitable shelter, or may be out in the open if no shelter is available. It must be accessible to all types of aircraft maintained by the service platoon, and must have a parking and runup area closely available. Organizational maintenance repairs and inspections beyond the capability of the crew chief will be performed in this area. The aircraft maintenance technician, assisted by the maintenance supervisor, controls the operation on this section.

(3) *Communications maintenance section.* The communications maintenance section consists of the communications chief and sufficient communications repairmen to perform the organizational maintenance on all communications equipment assigned to the company. This section should be located near the aircraft maintenance section so that communications equipment inspections and repairs may be accomplished at the same time that organizational maintenance is being per-

CHAPTER 7

PUBLICATIONS AND CHARTS

Section I. PUBLICATIONS

7-1. General

The organizational maintenance unit is responsible for obtaining and filing those publications which pertain to the administration and operation of the unit and its assigned equipment. Publications required to insure the safe operation and efficient maintenance of unit aircraft must be available and be kept current. Individuals assigned to the unit must be familiar with the publications system and must know how to use the appropriate publications in performing organization maintenance. They should be encouraged to rely on the information contained in the publications and to have the appropriate publications available at all times when working on aircraft. Army Regulations 310-1 and 310-3 cover military publications' general policies, preparation, coordination, and approval. They also contain a detailed explanation of the publications numbering system.

7-2. Publications Files

a. *Procurement.* Publications files will be accessible to all personnel. The two methods for obtaining publications for unit files are *pinpoint distribution* and *formula distribution*. DA Pamphlet 310-10 provides a comprehensive guide for acquiring adequate publications.

- (1) *Pinpoint distribution.* Pinpoint distribution is a method of initial distribution and resupply of selected publications directly to Active Army and USAR units from a single Adjutant General Publications Center (AR 310-1). Requirements are submitted on the appropriate DA Form 12-series through channels to the appropriate center. DA Forms 12-4 and 12-9 are used by aviation maintenance units for pinpoint distribution of adminis-

trative publications. DA Forms 12-31 and 12-34 cover the majority of technical publications required for aircraft maintenance. The unit determines which publications are required to accomplish its mission and fills out the applicable DA Form 12. This form is sent to the battalion or next higher headquarters for approval and for mailing to the U. S. Army Publications Centers (Baltimore or St. Louis) for direct distribution to the unit. Each unit which has an account with a U. S. Army Publications Center will be assigned an account number which must appear on all forms. When publications requirements change, a revised DA Form 12 must be sent through channels to the appropriate center. Certain publications, such as AR's and circulars, will be sent to battalion or group and will be broken down for issue to the assigned units. In this case, the unit requirements are sent to the battalion on a DA Form 12 where they are consolidated.

- (2) *Formula distribution.* Formula distribution is a list of specific using organizations with an allowance for each (AR 310-1). The formula distribution information listed on the publication determines who will receive it. Requirements for publications receiving a formula-type distribution are computed on DA Forms 12-1, -2, and -3. Additional copies of publications, replacement publications, or those which were not included on automatic distribution may be requisitioned on a DA Form 17. This form is for a one-time issue and will not

change the number or types of publications which will be received on pinpoint distribution.

b. Indexes. Military publications indexes are contained in DA Pamphlet 310-series and list all Department of the Army publications. Publications are listed in the indexes in the order shown on the front of the publication, in numerical order. An alphabetical listing by subject or item of equipment is in the back of each index. Individuals must understand the index system and the use of the indexes in order to identify and locate publications. To find a particular publication, an individual should look up the subject in the back of the index to find the number of the publication containing information on the subject. He may then turn to the numerical listing and obtain the detailed information on the publication (title, date, number of changes, etc.). The indexes of primary interest to the organizational maintenance unit are:

- (1) DA Pam 310-1, Military Publications: Index of Administrative Publications.
- (2) DA Pam 310-2, Military Publications: Index of Blank Forms.
- (3) DA Pam 310-3, Military Publications: Index of Doctrinal, Training, and Organizational Publications.
- (4) DA Pam 310-4, Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Manuals, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
- (5) DA Pam 310-22, Military Publications: Index of Supply Manuals: Transportation Items.

c. Currency of Files. Files will be checked against appropriate indexes to insure that they are up to date. After a file is initially established, its current status will be checked against each applicable new numerical index, revision, or supplement received. Each active file will be checked annually against the appropriate numerical index to determine any deficiencies or excesses in the file.

d. Inspection of Files. Publication files will be inspected to insure that—

- (1) All publications required by using personnel are available.

- (2) Files are conveniently located to users.
- (3) Unnecessary publications are not in the file.

e. Appendixes. An appendix is an addition to a publication and may include tables, charts, and supplementary information. It is an integral part of the publication, though not a part of the normal sequence of discussion. An appendix may be a part of the basic publication (e.g., an appendix of flight operating charts in a flight manual), or it may be issued separately to include additional information in an existing publication. Each separate appendix received will be filed at the end of the basic publication, which will be posted to show the addition.

f. Changes. Department of the Army publications are maintained in current status by the publication of numbered changes or revisions. The first change issued is numbered C 1, the second C 2, etc., and later changes may supersede previous one. As these changes become available, they are listed by change number, under the basic publication number and title, in the appropriate numerical index.

g. Technical Manuals for Aircraft Files. Each Department of the Army aircraft must have its individual publications file. AR 750-1500-2 lists those technical publications and forms which must be included in each file and contains instructions for their location and maintenance. Aircraft files will consist of those publications specified in AR 750-1500-2 and by current directives, plus others included by the maintenance officer, which are necessary for mission accomplishment. The maintenance officer must insure that maintenance personnel are aware of the location of the individual items included in the aircraft files and that they have access to them when required.

h. Disposition of Publications. Publications may be disposed of when they have been rescinded, replaced, superseded, or when they are no longer needed.

- (1) Unclassified publications will be disposed of as directed by the local salvage officer.
- (2) Classified publications will be destroyed in accordance with AR 380-5.

7-3. Technical Publications

Technical information on Army aircraft operation, maintenance, and supply is found in technical manuals, technical bulletins, modification work orders, supply manuals, and supply bulletins. These publications provide specific information on tools and repair parts allowances, operation, and maintenance and supply procedure for all aircraft.

a. Technical Manuals (TM).

(1) *Definition.* Technical manuals are divided into two groups (AR 310-1).

(a) *Equipment manuals.* These manuals cover preparation for use, operation, maintenance, and overhaul instructions. In addition, they contain parts lists and related technical information.

(b) *Other manuals.* These manuals are prepared on a variety of subjects, other than equipment, which are considered necessary for training.

(2) *Numbering.* Equipment manuals will be numbered as follows:

(a) The designated number of the preparing technical service.

(b) A dash and four digits representing the Federal Supply Classification or class (SB 708-21) assigned to the equipment.

(c) A dash and three digits beginning with 200. All parts of a technical manual on the same item of equipment will have the same number. Successive manuals in the same FSC groups or class will be numbered 201, 202, etc.

(d) A dash and two digits indicating the category of maintenance to which the manual applies.

1. Operator's Instructions -10.

2. Organizational Maintenance Instructions -20.

3. Support Maintenance Instructions -34.

4. Depot Maintenance Instructions -50.

5. Combination of categories. Support and depot combined would be numbered -35.

(e) A serial number of (/1, /2, etc.) when a manual part or part com-

bination is published in more than one manual.

(f) The suffix letter P for repair parts manuals.

(g) Manuals which prescribe equipment serviceability requirements will have -ESC immediately following the three digit item identification.

(h) Preventive maintenance inspection cards (daily, intermediate, periodic) will have either PMD, PMI, or PMP following the item identification.

Note. Other manuals are assigned a basic number indicating the subject matter to which the manual applies and a subnumber for further identification within its particular class.

b. *Technical Bulletins (TB).* Technical bulletins contain only technical information. They do not contain administrative material or material pertaining to tactical training or tactical operations. They may supplement TM's but will not make direct changes in the content of the manuals or be published in lieu of TM's. Technical bulletins applicable to aviation are prefixed by TB AVN. *Example:* TB AVN 7 covers the painting and marking of Army aircraft.

c. *Modification Work Orders (MWO).* Modification work orders contain instructions for the alteration and modification of materiel. They require compliance within specified time limits and are grouped according to the importance and urgency of the instructions they contain. They furnish supplementary instructions and operating procedures and are the only authorized media to provide modification instructions for aircraft and equipment. Commanders will insure that operating personnel become familiar with the contents of these publications. The two types of MWO's are *Urgent Action* and *Normal Action* (AR 750-5).

(1) *Urgent Action.*

(a) Urgent Action MWO's are issued to correct dangerous or potentially hazardous conditions which could result in injury to personnel, damage to property, or unacceptable reduction in combat efficiency. Such risks are calculated to be tolerable

only within definite time limits as specified in (b) below.

- (b) These MWO's either ground the aircraft immediately or specify that the work is to be completed within dates specified on the MWO, usually not to exceed 10 days after receipt of the MWO. The first page is bordered in distinctive red symbols with URGENT ACTION printed at the top of the page.
 - (c) Appropriate form entries will be made in accordance with TM 38-750.
 - (d) If compliance is not accomplished within the time limit specified, the aircraft condition status symbol will be changed as directed on the first page of the MWO.
- (2) *Normal Action.*
- (a) Normal Action MWO's are issued when procedural faults are found which would prove hazardous through prolonged, continuous use. These faults may be of a material mechanical, operational, or tactical type; they involve risks which are considered tolerable within broad limits. In addition to being hazardous, faults of this type may reduce—
 - 1. Operational efficiency.
 - 2. Operational life or general service utilization.
 - 3. Tactical or tactical support usefulness.
 - (b) Normal Action MWO's are printed on plain white paper without border symbols and are issued without recision dates. Each MWO will state who will accomplish the work, when it will be accomplished, instructions to be followed in the event it is not accomplished, by the specified time, the form entries required, the stocks affected, and the aircraft affected.

d. *Supply Catalogs and Manuals (SM).* Supply manuals contain item identification and operational information required by supply and related activities. They include the following:

Federal stock numbers, Federal item names and description, units of issue, expendability, parts allowances and stockage data, cross references, and other essential supply information. Supply manuals applicable to aviation are numbered SM 55, and are of five types:

- (1) *Type 1, SM 55-1 series.* Stocklist of all items, except repair parts.
- (2) *Type 2, SM 55-2 series.* Stocklist of all items, price list.
- (3) *Type 3, SM 55-3 series.* Stocklist of repair parts.
- (4) *Type 4, SM 55-4 series.* Stocklist of components of sets, kits, and outfits.
- (5) *Type 5, SM 55-5 series.* Stocklist of current issue items.

e. *Supply Bulletins (SB).* Supply bulletins contain information on the more technical aspects of supply matters, such as compiled logistical data, etc. They do not contain administrative supply instructions. Information pertaining to aviation supply may be found in the SB-1 or SB-55 series bulletins.

7-4. Supplementary Type Publications

a. *Safety of Flight Supplements.*

- (1) *General.* Safety of flight supplements are issued to give prompt safety of flight information. They contain important informational, operational, precautionary, and restrictive instructions that affect safety of flight but do not require grounding of the aircraft. When safety of flight information is applicable to more than one type of aircraft, separate supplements are issued for each type of aircraft involved.
- (2) *Types.* These supplements are issued in two forms—*interim* and *formal*.
 - (a) *Interim supplements.* Interim supplements are issued by teletype message when loss of life or serious injury to personnel may be involved.
 - (b) *Formal supplements.* Formal supplements are printed and distributed through normal channels when serious damage to the aircraft is involved, or to replace interim supplements.

APPENDIX III

INSPECTION GUIDES FOR ORGANIZATIONAL MAINTENANCE AND TECHNICAL SUPPLY

Note. These inspection guides will assist the organizational maintenance officer in performing inspections. They are not intended to be regulatory and may be modified as required. Additional guidance is contained in DA Pam 750-1.

I. MAINTENANCE OPERATION TECHNICAL INSPECTION GUIDE

Section I. GENERAL

1. Are maintenance records and facilities properly located in relation to each other and to the flight line? To the technical supply?

2. Is there a planned maintenance program actively supervised and controlled by a qualified maintenance officer?

3. Is the technical supply officer responsible to the maintenance officer?

4. Are necessary tools and repair parts for aircraft on hand and properly maintained?

5. Are working areas policed and free of safety hazards?

6. Are maintenance personnel properly supervised?

7. Are unauthorized tools and equipment on hand?

8. Does completed maintenance on aircraft undergo technical inspection prior to its release for flight?

9. Is there a clearcut SOP in effect between the mechanics and technical supply?

10. Is lateral transfer of parts controlled?

11. Is there a suitable area set aside for maintenance personnel to work on records, study technical manuals, etc.?

12. Is the maintenance office set up in an orderly manner with the required charts, files, technical manuals, etc., and arranged for the most efficient utilization?

13. Other?

Section II. ACCESSORY REPLACEMENTS

14. Are scheduled accessory replacements made at the nearest scheduled inspection time?

15. Are DA Forms 2410 initiated for applicable accessories upon removal from aircraft?

16. Are accessories ordered in advance as specified in the maintenance SOP?

17. Is proper procedure being used when accessory replacement time is extended?

18. Is the accessory replacement chart correctly prepared and does it include all required items?

19. Are circled replacement times backed up by parts request slips or a letter of notification to the field maintenance activity?

20. Do the replacement times agree with those in DA Form 2408-16?

21. Is the "Aircraft hours to date" column kept current?

22. Is the accessory replacement time circled when the accessory has been ordered?

23. Is the field maintenance activity properly notified of accessory changes for which they will be responsible as required in the maintenance SOP?

24. Other?

Section III. ARMY AIRCRAFT INVENTORY, STATUS, AND FLYING TIME REPORT (DA FORM 1352)

25. Are all blocks of the heading properly filled out?

26. Are the authorized aircraft listed by category?

27. Does Column C show a code for each aircraft?

28. Does Column D reflect the correct number of accountable hours?

29. Does Column D equal the sum of Columns E and F?

30. Does Column F equal the sum of Columns G, H, I, J, and K?

31. Is the aircraft daily status chart correctly prepared and utilized as required?

32. Other?

Section IV. MAINTENANCE FILES

33. Are files neatly arranged and properly identified?

34. Are DA Forms 2408-13 for the current month filed in a separate folder?

35. Is the current DA Form 2408-16 for each aircraft filed with the records for that aircraft?

36. Are the aircraft forms for the previous 6 months properly filed?

37. Is a work request file maintained, with completed work orders separated from those in suspense?

38. Are the loose equipment checklists filed for those aircraft in field maintenance?

39. Is an EIR file maintained?

40. Is a file of Army Aircraft Inventory, Status, and Flying Time Reports maintained?

41. Are maintenance directives, memoranda, etc., properly filed for easy reference?

42. Are duplicate copies of parts request slips, with supply action indicated, kept for each aircraft?

43. Are the required aircraft publications, less the maintenance records, complete and filed in a suitable location?

44. Other?

Section V. AIRCRAFT STATUS

45. Is a record of the current aircraft maintenance status kept as indicated in the maintenance SOP or by an equally efficient system?

46. Is the following information reflected: Total aircraft hours, next inspection due, aircraft hours next inspection due, hours remaining to next inspection, and date and reason aircraft is grounded?

47. Is all information accurate and current?

48. Other?

Section VI. TECHNICAL MANUALS

49. Are technical manuals on hand and filed?

50. Are required technical manuals on hand or on request?

51. Are changes properly posted?

52. Is followup action taken when requests are ineffective?

53. Is the current applicable DA Form 92-series on file and periodically reviewed?

Section VII. MATERIEL READINESS

54. Is equipment serviceability properly determined?

55. Are DA Forms 2408-3 submitted as prescribed?

56. Are DA Forms 2406 properly filled out and one copy submitted direct to the U. S. Army Maintenance Data Processing Center?

57. Are files maintained on ESC?

58. Are all forms and records for assigned equipment maintained in accordance with TM 38-750?

59. Are the procedures outlined in AR 11-14 being implemented and followed?

60. Does the unit profile indicate that the unit is combat ready?

II. TECHNICAL SUPPLY INSPECTION GUIDE

Section I. SUPPLY PROCEDURE (GENERAL)

1. Are supply facilities adequate?

2. Are supplies properly stored, identified, and safeguarded?

3. Are excess supplies on hand?

4. Are TOE and memorandum receipt items handled through tech supply?

5. Are supply files neatly arranged?

6. Are unserviceable, recoverable items allowed to accumulate in the maintenance area?

7. Are serviceable items, except common hardware and emergency items in the aircraft, kept in the supply room until needed?

8. Is close supervision exercised over the issue and receipt of parts?

9. Are accessory replacement items for a particular aircraft marked and held for that aircraft until needed?

10. Are flammable items stored properly?

11. Other.



FM 1-10 ARMY AVIATION ORGANIZATIONAL MAINTENANCE AIRCRAFT—1965

0001140502



PENTAGON LIBRARY